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ASSISTANCE IN THE DEVELOPMENT OF BUILDING MATERIALS AND SUPPLIES INDUSTRY FOR LOW-COST HOUSING

DP/INS/81/006

INDONESIA

Terminal report

Prepared for the Government of Indonesia
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

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Explanatory notes

The monetary unit in Indonesia is the rupiah (Rp).

References to dollars ($) are to United States dollars.

Besides the common abbreviations, symbols and terms, the following have been used in this report:

BIPIK	Project for extension services for development of small-scale industry within the Ministry of Industry
CPOT	Central Planning and Operational Team (of DP/INS/81/006, Jakarta)
CRDI	Ceramic Research and Development Institute for Industry, under the Agency for Research and Development for Industry, Ministry of Industry
CTA	chief technical adviser
DPMB	Building Research Institute (BRI), also known as the Institute for Research and Development of Human Settlements, Bandung. Formerly this unit was within the Directorate General of Cipta Karya, Ministry of Public Works and is now with the Agency for Research and Development within the Ministry of Public Works. The Institute for Research and Development is also an ESCAP Regional Centre for research and development of human settlements
INPRES	development projects supported by the President's office
KUD	village co-operative
NPD	national project director
NSC	National Steering Committee (of DP/INS/81/006)
PERUMNAS	National Urban Development Corporation, responsible for constructing mass public housing
POST	Planning and Operational Team on Site (of DP/INS/81/006, district level)
REPELITA	Indonesian Five-Year Development Plan
RPOT	Regional Planning and Operational Team (of DP/INS/81/006, provincial level)
RSC	Regional Steering Committee (of DP/INS/81/006)

ABSTRACT

The field activities of the project "Assistance in the development of building materials and supplies industry for low-cost housing" (DP/INS/81/006), for which the United Nations Industrial Development Organization was designated as the executing agency, started in June 1983 upon the arrival of the chief technical adviser (CTA) and the assignment of the national project director, and they ended on 31 December 1987. The project budget consisted of an input by the United Nations Development Programme of $2.7 million and a government input of Rp 2,351 million in kind.

During the lifetime of the project, three tripartite review meetings were held and one in-depth evaluation was carried out. The immediate objectives of the project, as modified by revision documents "H" and "J", were to establish a number of industrial village co-operatives producing standardized building materials and components for low-cost housing projects and to extract from the experience gained with those co-operatives elements of a policy that would be elaborated and implemented by the Government with a view to upgrading the small-scale building materials industry, thus enabling it to better meet the demands of the local market.

In a first step, the project organization was set up in such a way as to ensure a smooth implementation of the above objectives. By the end of the project, six model co-operative production units were established, four for clay bricks and roofing tiles and two for wooden components and wood preservation. The experiences gained by the involved government agencies during the establishment and initial operation of those model units are well documented and policy guidelines for future activities may be readily extracted.

The expert concludes that the valuable assistance given through the present project can only be considered as a first step towards solving the problems associated with the supply of building materials for low-cost housing. In his recommendations he indicates specific areas in which further assistance is needed if a nation-wide improvement is to be achieved.

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INTRODUCTION

A. Project background

Indonesia is the fifth largest country in the world in terms of number of inhabitants, at present estimated to be approximately 160 million. In 1971, only 18.8 per cent of them lived in urban areas. This proportion is gradually changing with a tendency to a more rapid growth in the cities (3.8 per cent per year) as compared to the national population increase (2.3 per cent). Consequently, the rate of urbanization is extremely high, especially in the large cities such as Jakarta and Surabaya. To cope with the problem of population growth alone, each year 736,000 units of new houses have to be built. Based on current projections of population growth and replacement of existing houses, a total of 1.5 million units of housing per year is needed, with the most severe shortage in urban areas.

To increase the supply of housing, Indonesia has to cope with serious problems concerning the strengthening of its existing housing delivery mechanism. In dealing with these problems enormous technical and financial resources must be brought together under an overall housing policy. A comprehensive development of the existing building-materials industry is part of that policy.

Since 1975 UNIDO has been assisting the Government in developing appropriate building materials and construction technologies and equipment, as well as in improving the industrial management. Initially (1975-1982) assistance was given through the UNDP-funded project DP/INS/74/034 to strengthen the capabilities of the national research and development institutions in developing appropriate technologies. That project had a UNDP input of $2.4 million and a government input of Rp 1,100 million in kind.

Since 1983, assistance has been rendered through the UNDP-funded project DP/INS/81/006, especially in establishing a close link between the various agencies and programmes related to the development and supply of building materials for low-cost housing. The project activities included the setting up and operation of six co-operative model production centres for building materials, four of which are producing clay building materials, and two treated timber and wooden components. These units will act as models for an overall development of the small-scale building-materials industries sector by the Government. The project was scheduled to last for four years.

It was envisaged that by the end of the project the small-scale building-materials industries will be able to supply all required basic materials for low-cost housing construction, resulting in considerable savings of financial resources and a better utilization of locally available raw materials.

B. Project history

The project document for the project "Assistance in the development of building materials and supplies industry for low-cost housing" (DP/INS/81/006) was signed in September 1982, for a total UNDP input of $2.7 million and a government input of Rp 2,351 million in kind. Project field activities began at the end of June 1983 upon the arrival of the chief technical adviser (CTA) and the assignment of the national project director.

A tripartite review meeting took place on 21 November 1984 to discuss the progress of the project activities. On that occasion it was recognized that the objectives and outputs stated in the project document covered a diffuse

range of different activities and that there was a need to clarify and consolidate the scope of the project and, consequently, to elaborate a precise work plan. Since these issues could not be resolved at that meeting, it was decided that an in-depth evaluation should take place within six months of the meeting.

That in-depth evaluation of the project was carried out in September/ October 1985 by a team comprising representatives of UNDP, UNIDO and the Government of Indonesia. The conclusions and recommendations made by the evaluation mission were considered at a tripartite review meeting held on 22 and 31 January 1986, and that meeting decided on the focus of future project activities, the disposition of national and international experts and a broad work plan until the end of 1986. The remainder of the project's life was to be devoted to follow up, as considered necessary and appropriate, of the policy recommendations that were elaborated based on the experience in setting up and operating the six model production centres, four of which were functioning and two additional units decided to be established by the end of 1986.

At a tripartite review meeting in January 1987 it was agreed that an extension of the project was necessary, in order to complete the establishment of the six production units. The project ended cn 31 December 1987.

RECOMMENDATIONS

1. The established model units should receive further assistance in (a) the marketing and promotion of their products in the construction-industry sector and (b) the continued monitoring of their financial management.

2. The units should be evaluated with respect to their viability and with a view to prepare policy proposals for the development of the small-scale building materials industries sector to support the development of low-cost housing.

3. As a follow-up to the training already given at the supervisory level to introduce a tile-laying service in the clay-production units, small groups of workers should be selected and given appropriate skills training. This type of specialized after-sales service is common for many products used in the construction industry and it certainly could be adopted by the model units.

4. Priority should be given to the completion of the classification of materials and the elaboration of national standards for use in the low-cost housing sector. Renewed efforts should be made by all agencies concerned to introduce a nation-wide application of these codes.

5. Further assistance is needed to reinforce the efforts of the model production units to introduce standard procedures for the establishment of an industrial co-operative. The Ministry of Co-operatives should be urged to increase its help in this matter. As the United Nations are at present assisting the Indonesian Government with regard to KUD activities, it should be ensured that the model production units will also benefit from that assistance.

6. The quality control systems within the production units should be reinforced. Because the establishment of material-testing laboratories in the region has not had the desired effect, it is recommended that most of the material-testing equipment be transferred to the respective production units, and that their management be given the full responsibility for the testing of materials and the control of the finished products.

7. The existing system of collating data on the capacity of the small-scale industries for building materials and the requirements of planned low-cost housing projects should be continued and expanded into a national scheme. The information collected should be incorporated into a supportive system for the development of low-cost housing.

8. The Government should encourage the maximum utilization of locally available raw materials and standard products for the construction of low-cost housing. This will help to ensure market balances and enhance the economic development of the regions and remote areas.

9. Recommendations relating to methods for the establishment of small production units on the sites of identified low-cost housing projects are contained in the report of CRDI, who has been subcontracted to carry out a study. Serious consideration should be given to the development of these small units, who could be involved in producing a wide range of finished products, e.g. pre-cast concrete items, timber components etc.

10. The policy of establishing an interlinkage between the government-sponsored low-cost housing projects and the informal sector of the small-scale

industries should be continued. This will have a positive effect on the industries concerned and contribute towards the economic development of the regions.

11. Arrangements should be made to transfer all project equipment to the Ministry of Industry, Jakarta, who in turn should formally issue the equipment, at present used in the regions, to the appropriate regional offices in Samarinda, Palembang, Surabaya and Malang. At an appropriate time, when the production units are firmly established, all equipment should be handed over to the KUD concerned.

I. OBJECTIVES AND LOGIC OF THE PROJECT

A. Development objective

The development objective of the project was "to assist in the realization of the [REPELITA IV housing] targets by establishing a system of co-ordination of the multi-sectoral/departmental activities for promoting the production of building materials and equipment, and the construction industry".

B. Immediate objectives

Originally the immediate objectives of the project were as follows:

(a) Establishment of:

(i) A central planning operations team (CPOT) at the government agencies involved in this project and located at Jakarta, to co-ordinate, plan and implement government programmes for low-cost housing, transmigration housing, school and hospital buildings and related issues, especially with a view to assessing the time and location based on requirements of building materials, supplies and equipment for these programmes and for ensuring adequate and timely supplies at desired locations;

(ii) Up to three regional planning/operation teams (RPOT) to implement the programmes prepared in (i) above, in the concerned regions;

(iii) Up to five project operation site teams (POST) to implement model programmes for selected PERUMNAS, transmigration and other construction projects for demonstration;

(b) Identification and implementation of opportunities for support by national research and development institutes, with a view to mobilizing and developing national technical expertise for the implementation of the above;

(c) Identification and implementation of new business opportunities for the production and supply of required materials and equipment in co-operation with respective government programmes.

These original objectives of the project were modified by revision document "H" in November 1986, and again by revision "J" dated May 1987. They now read as follows:

(a) To establish a number of industrial village co-operatives producing standardized building materials and components for supply to selected low-cost housing projects;

(b) To extract from the experiences of these units elements of policy for follow-up by the Government so that the huge housing market may be used as a major stimulus for the upgrading of small building-materials industries, enabling them to meet the demands of the market, thus eliminating existing bottlenecks in supply.

C. Project logic

The in-depth evaluation mission summarized its analysis of the objectives and the project logic as follows:

"The development objective and project objective represent a vague, confused set of statements containing elements of project background and justification, activities achievement indicators, and objectives at the wrong level. Reading them confuses the readers and leaves the project susceptible to severe implementation problems since the concept, approach and most importantly the project objective is unclear."

This anomalous situation was corrected by subsequent revisions.

D. Project organization

At the inception of work an organization structure was established for the project that is shown in figure I.

The project is formally the responsibility of the Ministry of Industry, but a multi-sectoral/departmental National Steering Committee (NSC) was established as a link to other ministries and agencies involved in this field of development.

Regional Steering Committees (RSCs) were established by government decrees at the request of the Ministry of Interior. The composition of the RSCs is similar to that of the NSCs, i.e. the members represent the same ministries and agencies, but at the regional level. The chairman of an RSC is the second assistant (responsible for economy, finance and development) to the Provincial Secretary of the Governor. The three selected provinces are South Sumatera, East Kalimantan and East Java.

In addition, NSC selected five project operation sites for the establishment of building-materials production units: Talang Kelapa and Palembang in South Sumatera; Samarinda and Tenggarong in East Kalimantan; and Malang in East Java. This decision became the focus of project operations.

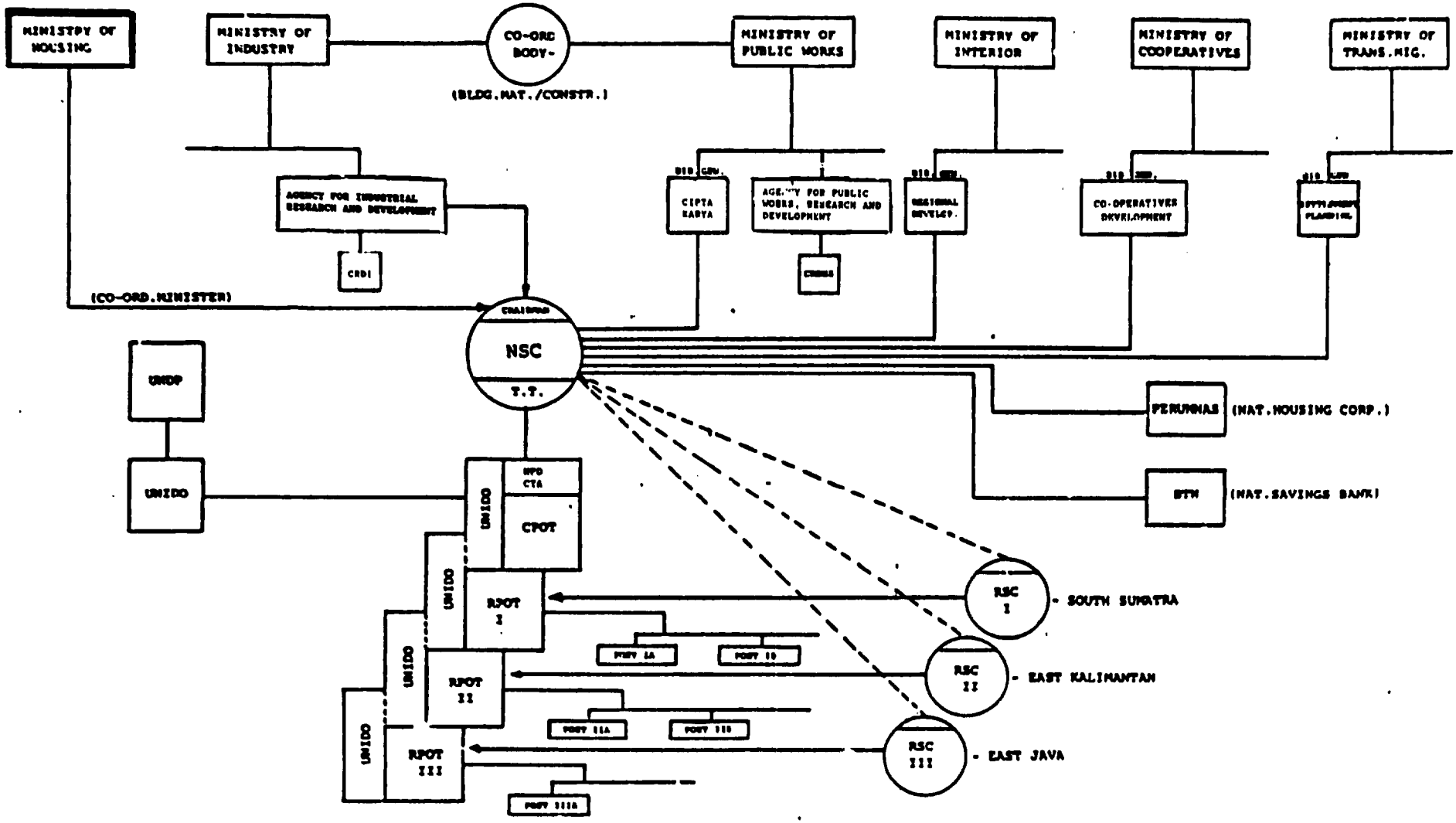
The project team is organized, as presented in figure I, in one central unit and three regional units, all staffed with UNIDO international and national experts and part-time government officials/experts.

The Central Planning and Operation Team (CPOT), located at Jakarta, is responsible for the overall execution of the activities. The three Regional Planning and Operation Teams (RPOTs) established at Palembang, Samarinda and Surabaya respectively, are composed of one international or national expert and counterparts from the respective regional office (Balai Industri). Under each RPOT, Project Operation Site Teams (POSTs) are established at the administrative center for the subregion in which the selected sites for the model production units are located. POSTs are staffed by government officials from the respective subregional offices (Kandep Perindustrian).

E. Outline of the project as implemented

The project started its operations in July 1983. This was preceded by the setting up of NSC to supervise project operations. In its session of 24 January 1983, a decision was made to establish the three regional offices mentioned in the project agreement in East Java, East Kalimantan and South Sumatra and to set up ad hoc RSCs. It was also decided that the project should have five production units, three for clay products and two for wood products, in the regions mentioned above, for which local POSTs were to be established.

Figure I. Project organization



During the second half of 1983 a detailed project plan of operations was prepared, as stipulated in the project document, to augment the tentative work plan of this document. The work plan was submitted to NSC at the end of 1983 and, in its second session of April 1984, the proposal was discussed. The work plan was not approved but general directives were given to adjust it.

A new proposal was prepared and discussed at the tripartite project review meeting held in November 1984. On that occasion several suggestions were made to better focus project activities. Based on these recommendations a modified version was presented at the third meeting of NSC held in February 1985, which focussed on the project scope, and was finally accepted by NSC which also recommended the preparation of a detailed programme of activities. That detailed work plan was completed in September 1985 for discussion at the next tripartite project review. During this tripartite review meeting, which was held on 22 and 31 January 1986 based on the findings of the in-depth evaluation mission, it was decided to revise the outputs and activities of the project as follows, with consequential effect on the project as a whole.

Outputs

(a) Six operating industrial village co-operatives comprising rural family enterprises traditionally engaged in building materials manufacture, in three different provinces, complete with appropriate industrial technology and improved management and marketing, producing standardized building materials and components, including contractual supply arrangements to selected low-cost housing and building construction projects, and assistance to those construction projects in improved application of the standardized materials and components;

(b) Technical and managerial manuals for the development, operation and management of small-scale building materials industries producing standardized building materials and components, summarizing the experience gained in the establishment of the above-mentioned industrial co-operatives;

(c) A technical manual for the rational application of standardized building materials and components, as produced by the above industrial co-operatives, in low-cost housing and building construction projects;

(d) Policy propsals, based on the experiences from the industrial co-operatives established by the project, of national relevance, for the upgrading of the small-scale building materials industry in order to ensure its competitiveness in terms of quality and price in the context of low-cost housing and building programmes in Indonesia;

(e) If considered necessary and desirable and within the framework of financial resources, initiation of some follow-up activities.

Activities

(a) Preparatory studies and analysis of low-cost housing demand and building materials needs;

(b) Analysis of potential and capacities of existing small-scale building materials industries;

(c) Preparation of viability studies of the "Solo Model" concept for interlinked development of small building materials industries with low-cost housing construction programmes specifically for the six industrial village co-operatives to be established.

Establishment of units

(a) Establishment of the following six industrial village co-operatives producing standardized building materials and components, including contractual supply arrangements to selected low-cost housing projects:

(i) South Sumatra (RPOT I):

Wooden components and preservation (POST IA)
Clay bricks and roofing tiles (POST IB);

(ii) East Kalimantan (RPOT II):

Clay bricks and roofing tiles (POST IIA)
Wooden components and preservation (POST IIB);

(iii) East Java (RPOT III):

Clay bricks and roofing tiles (POST IIIA1, Pakis, Malang)
Clay bricks and roofing tiles (POST IIIA2, Turen, Malang);

(b) Provision of technical assistance to the selected low-cost housing projects, in the rational application of standardized building materials and components.

Preparation of manuals

(a) Analysis of the six established industrial village co-operatives, including supply arrangement to low-cost housing construction projects, and of the improved application of standardized building materials and components in these projects;

(b) Preparation of technical and managerial manuals for the development and operation of industrial village co-operatives for the production and supply of standardized building materials and components;

(c) Preparation of technical manuals for the rational application of standardized building materials and components in low-cost housing construction.

Policy proposals

(a) Analysis of experiences in establishing and operating the industrial village co-operatives and determination of supplementary data (if any) required to elaborate policy elements of national relevance;

(b) Collection and collation of data;

(c) Conducting of studies based on the above, and elaboration of proposals and recommendations of a policy nature in order to upgrade small-scale (informal sector) building-materials industries in the context of the massive low-cost housing and building programmes in Indonesia;

(d) Initiation of some activities, if considered necessary and desirable, as a follow-up of the above proposals.

Work plan

The tripartite review meeting specified that the main activities of the project were to terminate on 31 December 1986 and outlined the following time-schedule for the work:

(a) Promotion and marketing of the products of the already established four clay-bricks and roofing-tiles model production units, to the low-cost housing and building programmes within their regions;	Continuing activity
(b) Collection and collation of data and experiences of all units during their linking processes with the market sector for the preparation of policy proposals;	March 1986 to October 1986
(c) Completion of the establishment and trial operation of two wood-working model production units at Palembang and Samarinda;	31 December 1986
(d) Completion of all technical and management manuals specified under outputs;	31 December 1986
(e) Mission of a high-level consultant to advise on the collation and compilation of data already generated and to specify supplementary data;	June 1986 to July 1986
(f) Policy-oriented study;	November 1986 to February 1987
(g) Follow-up activities, including the finalizing of the studies for policy proposals to the Government.	March 1987 to July 1987

Summary of the project logic

The project logic may be summarized as follows: to achieve the project objectives, the following activities are to be carried out:

(a) Establishment of a project organization reaching from the national level (CPOT) through the regional level (RPOT) to the subregional level (POST), based on the existing structure of the government apparatus and comprising of officials from all ministries and agencies responsible for the development of housing construction and building-materials production (see figure I);

(b) Establishment, through this project organization, of a number of co-operative model production units in selected regions for the production of standardized materials, including supply arrangements to selected government and private projects;

(c) Analysis of experiences gained in the establishment of these production units, and formulation of policy proposals for the development of the small-scale building materials industry to support the low-cost housing and building programmes.

II. ACTIVITIES CARRIED OUT AND OUTPUTS PRODUCED

A. Introduction

From its inception the project initiated a great variety of activities in accordance with the project document, guided by the National Steering Committee (NSC), especially through its Technical Team (TT). With the help of the first tripartite review meeting in November 1984, these activities were specified and grouped into three major fields:

(a) Co-ordination of demand and supply of building materials for low-cost housing;

(b) Development of the building-materials industry;

(c) Development of construction technology.

At the second tripartite review meeting which was held in January 1985, and based on the findings of the in-depth evaluation mission, it was decided to discontinue activities of groups (a) and (c) and to concentrate on finalizing the activities of group (b), i.e. the development of the building-materials industry. A few other activities, notably the data-processing system already developed, were incorporated in the project's scope. A list of specific project activities was prepared (see chapter I, section E) covering the project's expected area of operation.

In this chapter these activities and their outputs are described and evaluated. The elaboration of policy proposals was assigned to a special consultant and they are presented in a separate report. In this connection, see annex I for a list of UNIDO experts, annex II for the government project personnel, and annex III, containing a list of the major documents produced.

B. Compilation of data

In order to analyse the requirements and capabilities of the low-cost housing sector, and to ensure that the housing programme targets are realistically set, it is necessary to determine whether the required inputs, in terms of building materials and housing construction services, are sufficient to meet the housing demand envisaged by government and private housing planners. As these major inputs must be drawn from available data on the building-materials and the construction industries, the capacities of these industries have to be assessed. For that purpose recent data have been collected and collated in document "Low-cost housing, requirements and capabilities" (see annex III).

The above-mentioned document presents an overview of the magnitude and relative importance of the different categories of housing construction and improvement programmes in REPELITA IV and the broad aggregated requirements of building materials. It also provides a statement of production capacities for the different building materials, on the basis of information collected and collated from relevant official agencies, and a statement relating to the capabilities of the construction industry to meet national demands. The document also shows that the aggregate national capacities are much larger than the aggregate requirements for the housing programmes of REPELITA IV. However, it considers such a straight comparison inappropriate for the following reasons:

(a) Building materials are required for other construction work apart from housing;

(b) Requirements and production capacities may not necessarily be matched at each location;

(c) Some portion of the capacity may require up-grading in order to ensure products of acceptable quality, dimensional tolerances etc.

Reference has also been made to an in-depth study on this subject which was carried out by the Indonesian consulting firm SGV-UTOMO, under an earlier UNIDO-executed project (DP/INS/74/034). The report "Housing construction capacity studies in nine selected urban development centres" aimed at assessing in the nine largest urban centres, the capacity of the building-materials industry, together with the capacity of the building-construction industry, to respond to the projected housing-construction development under REPELITA III. As part of the studies, possible bottle-necks were to be determined and action programmes to be suggested to alleviate them.

The report contains data on population and housing, and a thorough calculation of future housing requirements was made based on population levels and growth, and on the existing housing situation in the nine towns. Based on the projected future housing requirements (plus allowance made for non-housing development) future requirements of essential building materials were derived for the years 1981 to 1984. Due to the scarcity of data and the inappropriateness of the method of direct comparison of requirements against capacity, as explained above, it was not possible to identify specific bottle-necks in capabilities <u>versus</u> requirements. It is recommended that such exercises be done on a location/time basis if a quantification of bottle-necks is required.

To permit a comparison of requirements and capabilities on a location/time basis, the project has developed a computerized data-processing system. In its present form the system comprises three programs:

(a) PERUMNAS low-cost housing projects;

(b) Transmigration housing;

(c) Building-materials industry.

The system may well be expanded later to include other housing programmes.

Programs (a) and (b) above allow for a detailed study of the planned housing schemes, the corresponding bills of quantities and the required quantities of materials and labour for a particular planning period in a particular location in Indonesia. Since these systems can make the above calculations for several user-selected combinations of materials and construction methods (for the same housing project or grouping of projects), they can also be used in the preparation of alternative proposals concerning selected materials and construction methods.

To be able to adjust the data-processing system to eventual future changes in the policy and physical planning of PERUMNAS and Transmigration, the project has developed several additional "utility" programs for adaption of the main data-processing systems to these changes. Combined with the processing system for data on the building-materials industry ((c) above), demand schedules (with eventual identification of bottle-necks) can be prepared. Since the data bank stores information on the building-materials industry as well as data on the actual production capacity, this system can

also be used in the analysis of the efficiency of the existing building-materials industry (e.g. to decide whether to upgrade existing industries or to add additional capacity).

Efforts have been made to describe these three systems in detail, and a complete manual for each system is contained in separate reports.

C. Establishment of six industrial co-operatives

A major activity of the project was the establishment of six industrial village co-operatives producing standardized building materials. In this section the present status of the units is summarized.

The equipment supplied by UNDP/UNIDO is listed in annex IV and the training delivered under the project in annex V. Furthermore, annex VI contains the policy guidelines for the establishment and administration of a production unit, elaborated under project DP/INS/81/006. Annex IX contains photographs depicting activities in the six model production units.

South Sumatra, RPOT I

(a) Wood component production and timber preservation unit, Sungai Buaya, Palembang (POST IA)

1. Infrastructure

(i) Land

- Located in Desa 15 Ulu, subdistrict Seberang Ulu I, area 3,000 m^2
- Local government property allocated to a non-active local government enterprise (a previous title factory)
- Permission for use of the land given by the local government;

(ii) Machines

- UNIDO input (machinery) worth Rp 136,219,520
- All machines are installed and operating;

(iii) Building and other facilities

- The main building is completed. The construction was financed by the local government (DIPDA)
- Rehabilitation of other existing buildings, road construction in the factory complex and transport cost of the machines from Palembang to the project site was financed by the local government
- Transport of some of the machines, which were purchased with the installation included, were financed by UNIDO; also provided by the project were water and electrical power installations.

2. Organization and management

(i) Co-operative

- Name of existing local co-operative: KUD Segentar Alam;

(ii) Status of the unit

- At present managed by the local government. KUD integration being processed;

(iii) Personnel

- All required personnel have been recruited;

(iv) Training

- The personnel has been trained in: testing, management and administration, saw doctoring, assembling (wooden components), timber preservation and machine operation

- All the training was financed by UNIDO.

3. Operation and marketing

(i) Trial runs

- Trial runs were carried out in November 1986;

(ii) Capacity

- Unit capacity: 1,600 m^3/year

- Treatment capacity: 2,000 m^3/year
(two loadings per day);

(iii) Production quality

- According to the Indonesian Industrial Standard (SII);

(iv) Marketing

- Local market well established;

(v) Local investment capital

- For main building and other facilities: Rp 35 million (DIPDA budget 1986/1987);

(vi) Working capital

- Rp 20 million (DIPDA budget 1986/87)
Additional capital from local government proposed for DIPDA budget 1987/88 as necessary.

4. Outstanding problems

(i) The application of the KUD system within the unit is proving difficult;

(ii) Transfer of technology programme needs to be established.

(b) Clay bricks and roofing tiles production unit, Talang Kelafa, Palembang (POST IB)

1. Infrastructure

(i) Land

- Located in the village of Sukajadi, subdistrict Talang Kelapa, district Musi Banyuasin
- Property of KUD member Mr. Wahid, including the buildings and raw-material resources
- Mr. Wahid will get a compensation of 5 per cent of roofing tiles selling price and 10 per cent of clay bricks selling price;

(ii) Machines

- UNIDO input (machinery) worth Rp 19,829,520; this includes transport and installation;

(iii) Building and other facilities

- Buildings were available (Mr. Wahid's property)
- Four kilns with a total capacity of 48,000 roofing tiles were constructed (Mr. Wahid's property);

2. Organization and management

(i) Co-operative

- Name of existing local KUD: Karya Tani KUD, Talang Kelapa subdistrict;

(ii) Status of unit

- Karya Tani KUD clay bricks and pressed roofing tiles unit is one integrated unit of the KUD under the chairmanship of Mr H. Ujang Ibrahim
- Special working groups are formed for each of the five presses;

(iii) Personnel

- Local craftsmen operate the unit
- The production manager is Mr. Wahid
- General manager is Mr. H. Ujang Ibrahim;

(iv) Training

- The personnel has been trained in: testing, production technology, management and administration
- All training was financed by UNIDO.

3. Operation and marketing

(i) Trial runs

- Machine trial runs were carried out in March 1985
- The transfer of the machines and equipment to KUD was formalized on 17 October 1985;

(ii) Capacity

- Capacity: 125,000 roofing tiles per month
- Production: 48,000 roofing tiles per month plus 50,000 clay bricks;

(iii) Production quality

- According to the Indonesian Industrial Standard (SII);

(iv) Marketing

- No contract has yet been arranged with PERUMNAS, BTN and INPRES projects
- The present production sells well on the public market;

(v) Local investment capital

- Building site and kilns provided by Mr. Wahid against a special compensation;

(vi) Working capital

- Rp 3 million.

4. Outstanding problems

(i) Improvement of production capacity by construction of additional kilns;

(ii) Establishment of market linkages to low-cost housing projects;

(iii) Transfer of technology programme needs to be established.

East Kalimantan, EPOT II

(a) Clay bricks and roofing tiles production unit, Samarinda Ilir (POST IIA)

1. Infrastructure

(i) Land

- Located in the village of Sempaja, subdistrict Samarinda Ilir, Kotamadya Samarinda, area 4,000 m^2
- Mr. H. A. Rauf's property, who has given permission (written agreement) to use the land

- Compensation agreement with Mr. Rauf for the use of his land and raw material resources has been legalized;

(ii) Machines

- UNIDO input (machines) worth Rp 22,578,520. This includes transport and installation;

(iii) Building and other facilities

- Site preparation and levelling carried out by Mr. H. A. Rauf
- The main building for the extruder constructed with funds from the local government (DIPDA budget 1985-1987)
- Racks and pallets for a total capacity of 5,000 roofing tiles provided by Mr. Rauf
- Road leading to the project site of 700 m length carried out by public works (local government funds)
- Kiln has been constructed with assistance from BIPIK. A second kiln has been provided by UNIDO.

2. Organization and management

(i) Co-operative

- The co-operative has been established as a pilot industrial co-operative in agreement with the office of the Ministry of Co-operatives, Samarinda
- Name of the co-operative: Sumber Murni, Chairman: Mr. H. A. Rauf;

(ii) Status of the unit

- A legal contract has been signed between the private company CV. Tritunggal Jaya Membangun and the KUD;

(iii) Personnel

- Personnel has been recruited;

(iv) Training

- The personnel has been trained in: testing, production technology, management and administration
- All training was financed by UNIDO.

3. Operation and marketing

(i) Trial runs

- Machine trial runs were carried out in August 1986;

(ii) Capacity

- Unit capacity: 125,000 roofing tiles/month
- Production: 20,000 roofing tiles/month;

(iii) Production quality

- According to the Indonesian Industrial Standard (SII);

(iv) Marketing

- No contract has yet been arranged with PERUMNAS, BTN and IMPRES projects

- The present production sells well on the public market;

(v) Local investment capital

- Land provided by Mr. H. A. Rauf (including soil levelling)

- Main building and extruder building financed by local government (DIPDA budget 1985/1986)

- Kiln financed by BIPIK: Rp 8 million;

(vi) Working capital

- Rp 20,000,000 provided by a private company.

4. Outstanding problems

(i) Improvement of production capacity by construction of additional racks and pallets;

(ii) Establishment of market linkages to government construction projects;

(iii) Failure of BIPIK kiln seriously affected production.

(b) Wood component production and timber preservation unit, Segihan, Tenggarong, East Kalimantan (POST IIB)

1. Infrastructure

(i) Land

- Located in the village of Sigihan, Sebulu subdistrict, Kutai district

- The land is part of land used by Pertamina and was previously allocated to P. T. Huffco. Huffco as well as Pertamina have agreed to the use of 1 ha by the project (written permission);

(ii) Machines

- UNIDO input (machines) worth Rp 136,219,520

- All machines have been delivered to the site for installation in January 1987;

(iii) Building and other facilities

- The main building is completed. As the co-operative was not able to finance the building (and the working capital) a co-operation arrangement with a local government enterprise (P. D. Peryanida) has been established. Legal documents for this purpose were elaborated by the project and were signed in October 1986.

2. Organization and management

(i) Co-operative

- Name of existing local KUD: Cahaya Tani. The KUD is involved in forest exploitation activities. The joining government enterprise, P. D. Peryanida, is involved in construction contracting and is a forest concession holder;

(ii) Status of the unit

- The legal documents for the unit as a joint-venture activity between the KUD and P. D. Peryanida have been formalized;

(iii) Personnel

- Personnel has been recruited from within the KUD and P. D. Peryanida;

(iv) Training

- The personnel has been trained in: testing, management and administration, saw doctoring, assembling (wooden components), timber preservation and machine operation

- All training was financed by UNIDO.

3. Operation and marketing

(i) Trial runs

- Trial runs were carried out in April 1987;

(ii) Capacity

- Unit capacity: 1,600 m^3/year

- Treatment capacity: 2,000 m^3/year (two loadings per day);

(iii) Production quality

- According to Indonesian Industrial Standard (SII);

(iv) Marketing

- Arrangement for product specification and marketing in progress

- The provincial office of the Ministry Transmigration has expressed interest in a complete assembly set of transmigration houses

- Present marketing activities are being directed towards the private sector;

(v) Local investment capital

- Investment capital from the joint-venture participant P. D. Peryanida for working bui?ding and other facilities approximates Rp 40 million;

(vi) Working capital

- Working capital from the joint-venture participant P. D. Peryanida approximates Rp 20 million.

4. Outstanding problems

(i) Follow-up of marketing for an assembly set of transmigration houses with the transmigration office;

(ii) Consolidate links with the government sponsored low-cost housing projects;

(iii) The specifications of components to be produced need to be defined.

East Java, PROT III

(a) Clay bricks and roofing tiles production unit, Pakis KUD, Malang (POST IIIA1)

1. Infrastructure

(i) Land

- Located in the village of Saptorenggo, Pakis subdistrict, Malang district

- PUSKUD property, has been purchased for Rp 10 million, area: 4,000 m^2

- Has been transferred to Pakis KUD;

(ii) Machines

- UNIDO input (machines) worth Rp 18,703,520

- All machines have been installed and are in operation;

(iii) Building and other facilities

- Buildings with a total capacity of 10,000 pallets for roofing tiles, building for extruder and construction of kiln was provided by the KUD with a capital input of Rp 18 million

- Access road to the project site was financed by the local government with a capital input of Rp 2 million.

2. Organization and management

(i) Co-operative

- Name of existing KUD: Pakis;

(ii) Status of unit

- The roofing-tiles unit is a unit of Pakis KUD. The unit manager is Mr. Edy Mangindaan;

(iii) Personnel

- Local craftsmen operate the unit

- The office of Ministry of Industry in Malang has provided an officer to supervise the operation of the production unit;

(iv) Training

- The personnel has been trained in: testing, production technology and management and administration

- All training was financed by UNIDO.

3. Operation and marketing

(i) Trial runs

- Trial runs were carried out in March 1985

- Machines and equipment were handled over to the KUD in November 1985;

(ii) Capacity

- Unit capacity: 125,000 roofing tiles/month

- Present production: 45,000 roofing tiles/month;

(iii) Production quality

- According to Indonesian Industrial Standard (SII);

(iv) Marketing

- A contract for the supply of 81,400 roofing tiles to the PERUMNAS project in Malang for a price of Rp 82/tile has been concluded

- The unit is presently supplying the public market which can absorb the production at a selling price of Rp 90/tile. Sales are good;

(v) Local investment capital

- The investment capital provided by PUSKUD East Java and Pakis KUD amounts to Rp 28 million

- The investment by PEMDA for the access road amounts to Rp 2 million

- Additional investment capital is needed for the extension of buildings, racks and pallets for a total capacity of 85,000 roofing tiles/month.

4. Outstanding problems

(i) Linkage with government-sponsored low-cost housing projects needs to be established;

(ii) A quality control system for products needs to be introduced.

(b) Roofing tiles production unit, Turen KUD, Malang (POST IIIA2)

1. Infrastructure

(i) Land

- Located in the village of Talangsuko, Turen subdistrict, Malang district

- Craftsmen's property;

(ii) Machines

- UNIDO input (machines) worth Rp 18,703,520

- All machines have been installed and are in operation;

(iii) Building and other facilities

- Buildings are provided by each of the production groups with loans from the KUD and by private contributions, including the racks and pallets

- Racks capacity totals 3,000 roofing tiles and pallets capacity totals 6,400 roofing tiles.

2. Organization and management

(i) Co-operative

- Name of existing KUD: Turen

- The roofing-tiles unit is a unit of Turen KUD;

(ii) Status of unit

- Turen unit is a non-integrated unit, controlled by a unit manager

- Five subunits are managed by individual craftsmen who operate in separate groups, each with one press;

(iii) Personnel

- Local craftsmen operate the unit

- The office of the Ministry of Industry in Malang has provided an officer to supervise the operations of the production unit;

(iv) Training

- The personnel has been trained: in testing, production technology, management and administration

- All training was financed by UNIDO.

3. Operation and marketing

(i) Trial runs

- Trial runs were carried out in March 1985

- Machines and equipment were handed over to the KUD in November 1985;

(ii) Capacity

- Unit capacity: 125,000 roofing tiles/month

- Present production: 30,000 tiles/month;

(iii) Production quality

- According to Indonesian Industrial Standards (SII);

(iv) Marketing

- KUD Turen has supplied 23,900 roofing tiles to the PERUMNAS project in Malang for a selling price of Rp 82/tile

- KUD Turen has in the past been very weak in marketing; however, after the recent training provided by UNIDO, its marketing activity has improved;

(v) Local investment and working capital

- The KUD invested Rp 1,190,000 and the craftsmen Rp 2,500,000 for production buildings, extruder building, racks and pallets construction and for the initial working capital

- The unit still needs additional investment and working capital to increase its production capacity

- Efforts to obtain credits from banks have not been successful.

4. Outstanding problems

(i) Strengthening of marketing activities required;

(ii) Assistance in obtaining additional investment and working capital needed.

D. Description and analysis of the model production units

For each of the six established model production units, a project description has been prepared. The main purpose of these descriptions are:

(a) To document the physical establishment;

(b) To analyse the feasibility of the units;

(c) To serve as guide for the establishment of other units.

Each project description is structured in accordance with UNIDO's Manual for the Preparation of Industrial Feasibility Studies, and comprises information on the units under the following headings:

I. Introduction
II. Background and history
III. Market and plant capacity
IV. Material input
V. Location and site
VI. Project engineering
    1. Layout and physical coverage of the project
    2. Equipment
    3. Technology
    4. Production process
VII. Plant organization
VIII. Manpower
IX. Implementation
X. Financial and economic evaluation.

The titles of the six project descriptions are:

"Industrial village co-operative producing standardized wood components in Palembang, South Sumatra (POST IA)"

"Industrial village co-operative producing standardized clay bricks and roofing tiles in Talang Kelapa, South Sumatra (POST IB)"

"Industrial village co-operative producing standardized wood components in Segihan, Tenggarong, East Kalimantan (POST IIB)"

"Industrial village co-operative producing standardized clay bricks and roofing tiles in Samarinda, East Kalimantan (POST IIA)"

"Industrial village co-operative producing standardized clay bricks and roofing tiles in Pakis, Malang, East Java (POST IIIA1)"

"Industrial village co-operative producing standardized clay bricks and roofing tiles in Turen, Malang, East Java (POST IIIA2)"

These project descriptions are issued as separate reports.

E. Guidelines for appropriate utilization of construction materials in low-cost housing

To ensure a proper application of the products in low-cost housing construction projects and thereby enhance the acceptance of the products, a

series of guidelines has been prepared by the project. These guidelines are issued in a separate report, entitled "Manual for rational application of standardized building materials and components".

The manual covers the following topics:

- Modular design of low-cost housing
- Standard wood components
- Roof support structures
- Application of clay roofing tiles
- Bricks and block construction
- Cost comparisons and economy
- Manpower and skills requirements
- Tender documents.

F. The co-operative system

The project has endeavoured to conform with the government policy of establishing the six model units within a KUD (village co-operative) system. However, the idea of forming an industrial co-operative is new in Indonesia and some of the units faced many problems in their attempts to introduce the recommended approach, which is illustrated in figures II and III.

During the past year additional training has been given to the unit personnel to improve their understanding of the application of the KUD system within their production unit. The training programmes have had some measure of success, and activities towards solving this problem have increased.

The establishment of an industrial co-operative within a KUD system can work, this has been clearly demonstrated by the production unit at Pakis, Malang.

The conclusion which could be drawn from analysing the difficulties which the units have faced in their attempts to introduce a KUD system, is that when planning new model units the interest and involvement of the co-operative movement must be clearly established before proceeding with the technical feasibility studies. The acceptance by the manpower to be organized through a co-operative system varies widely from one locality to another.

G. Marketing

Throughout the running-in period the production units relied heavily on support from the project personnel to solve their marketing problems. Now the onus is placed on the management of the production unit to cope with that important task. Providing the units with "captive markets", organized through the local government, RPOT etc., is only a temporary arrangement to assist the units during the difficult take-off period.

The recent training programme organized by the project to assist in this area had some positive effect on the management, who are now more motivated to expand and emphasize marketing activities.

H. Materials for low-cost housing

Considerable energy and resources have been invested in the past by government agencies and United Nations projects in the research of building materials for the construction industry, including materials suitable for application in the low-cost housing sector. However, apart from roofing tiles, efforts to make use of this research work have been limited. In recent years DPMB has introduced mobile units to demonstrate the use of some materials, but this programme has been discontinued.

Figure II. KUD formation

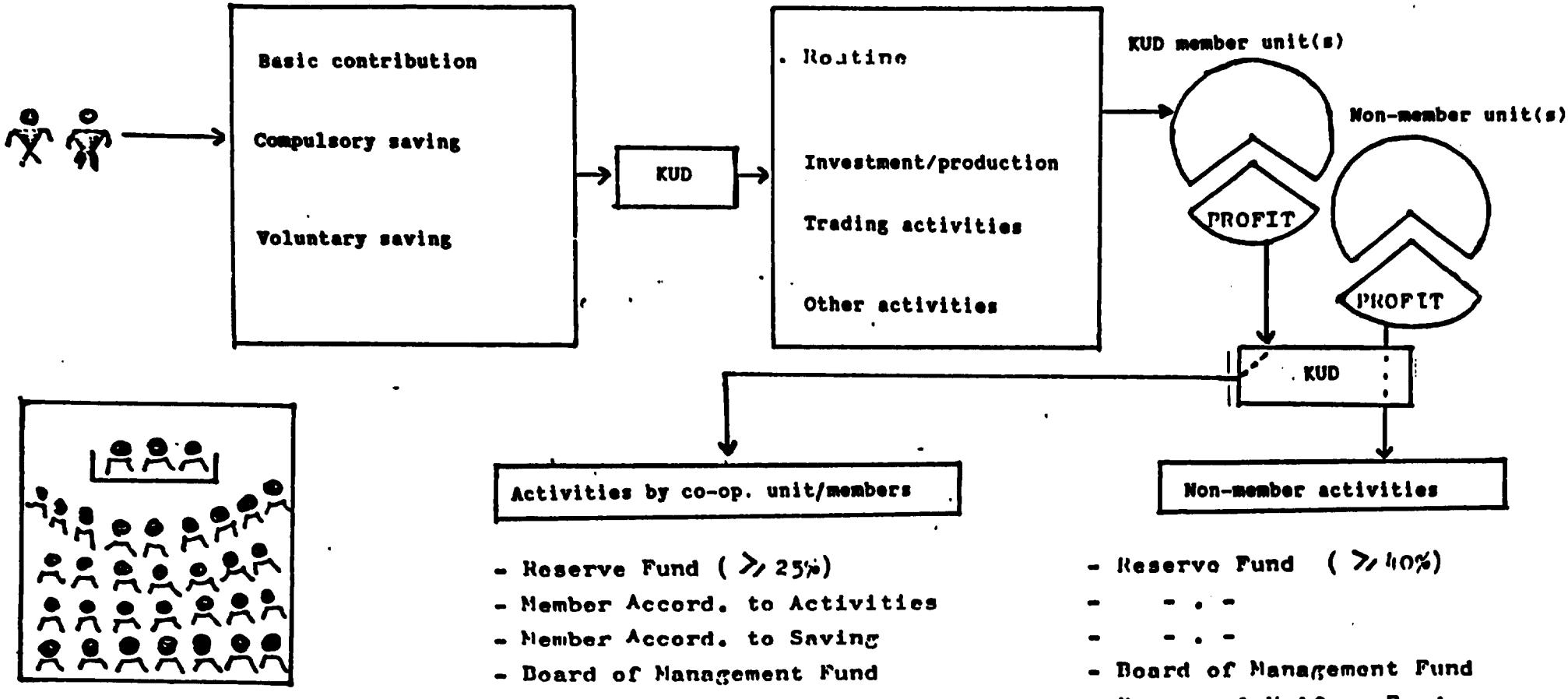
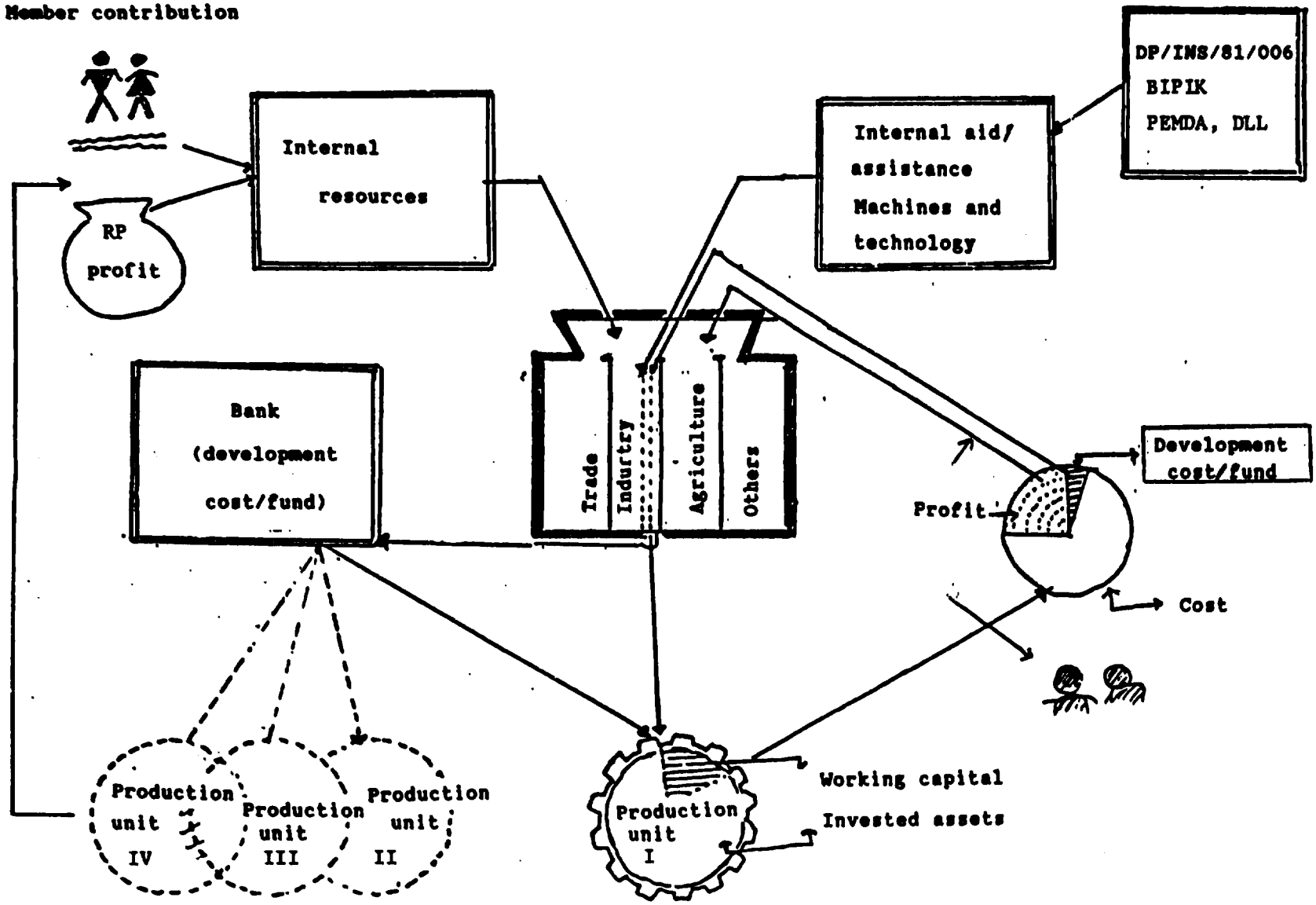


Figure III. Financial investment and development plan for a production unit



There remains a strong need to encourage a better utilization of locally available raw materials, and the promotion of new and appropriate building materials for low-cost housing has to be stepped up. Originally this was an activity of the project but was dropped during revisions.

I. Interlinkage between material production and construction industry

A linkage between the large government-sponsored low-cost housing schemes and the production units was successfully introduced in the Malang region, where PERUMNAS was active. The PERUMNAS management at Jakarta, following the government policy to give support to the informal sector involved in production activities, gave directives to their offices in Malang to consider the use of the products from the model units in Pakis and Turen. A contract was successfully negotiated. However, this approach cannot be applied to other projects, for example those supported by INPRES, because the Public Works Departments in the provinces apply different standards for construction work and the materials they specify are often of different sizes.

In the absence of a national system for the standardization of materials for low-cost housing, the units must adapt to existing markets. This means the possible production of smaller sized tiles at lower prices. This approach is already being successfully followed by the Turen unit. The importance of market surveys must be stressed, product promotion must be intensified and marketing techniques strengthened.

In the case of the two wood production units, linkage with the construction industry is being successfully developed through local governments and government enterprises.

III. ACHIEVEMENT OF IMMEDIATE OBJECTIVES

Due to the vagueness of the former project objectives as stated in the project document, this chapter relates to the project logic as described in chapter I, section E.

A. Establishment of project organization

Chapter I, section F outlines the structure of the project organization. The main responsibility for the planning and execution of project activities lies with the Central Planning and Operational Team (CPOT) to which the national project director (NPD), the chief technical adviser (CTA) and the major part of UNIDO experts are attached. The work of CPOT is monitored by a special Technical Team (TT) of the National Steering Committee (NSC) in accordance with national policy guidelines for the project formulated by NSC.

The execution of activities in the field is entrusted to the Planning and Operational Teams on Site (POSTs) under the supervision of the Regional Planning and Operational Team (RPOT) which acts as regional co-ordinator of activities within its region. RPOT executes its functions under technical authority from CPOT, taking into account specific regional policies formulated by the Regional Steering Committee (RSC).

Technical assistance is provided by UNIDO to CPOT (experts) and to RPOT/POST (field experts, equipment and training of production-unit staff), and by national research and development institutes and other relevant government agencies to all levels of the organization.

The advantages of the existing project organization are the following:

(a) Full responsibility for field activities is with RPOT and RSC from the planning to the follow-up stage, thereby ensuring availability of local expertise;

(b) All activities are in full accordance with national as well as regional policies and intentions;

(c) The activities can continue after termination of the United Nations technical assistance; follow-up work or initiation of new activities will be handled by the local government with technical assistance from national institutes and agencies.

With the existing project organization it has been possible to establish six co-operative production units; the arrangement may thus be regarded as effective. Its future success will depend to a great extent on the determination of the Government, especially that of the local governments to continue the co-operation along the lines established by the project organization. Funds for production equipment are available through the small-industry credit system, and other resources, including expertise for the execution of activities, are available at the supporting government institutes and agencies.

A major constraint, however, has been marketing. Although representatives of government construction projects are members of the project organization and are able and willing to provide contacts, the actual interlinkage between the production units and the construction projects is a complicated procedure and requires much more effort than anticipated. Some successful interlinkages have been established, but the involved government institutes and agencies need to be strengthened to achieve better results in the future.

B. Establishment of model production units

A phased approach was implemented for the start up of production activities for all the units. Some units were able to solve their working problems faster than others, however the point has now been reached where all the units are underway, and if they continue on the present progressive path their successful future is ensured.

The size of the units, the type and quantity of equipment and their production capacities, have been the subject of many reports in the past, some containing negative and some positive comments. To give a better understanding of the planning and operation of the units the following points of information are stressed:

(a) The extruder and presses supplied to the clay units are of special heavy-duty design which process the raw material for the production of a high-quality, standard sized brick or tile. These machines cannot, as is frequently suggested, be substituted by smaller and cheaper equipment;

(b) The market for roofing tiles varies. The production units are now adjusting to the demand for three types of tiles:

(i) The large tile designed by the project;

(ii) A small tile based on the project design;

(iii) A good quality tile of traditional design;

To organize a production set-up that can cope with the varying products, which also must include a variety of ridge tiles, the utilization of all five presses supplied is envisaged;

(c) The establishment of the wood-production units has required substantial capital investment, but the result is that the existing model units have all the necessary basic equipment to process timber to a finished product, including timber treatment. The units are now planning to build a timber drying kiln. A biomass gasification plant for power generation has been installed at both, the unit in Palembang and Samarinda. The potential of these units to contribute to and improve the supply of products to low-cost housing projects, and also at the same time act as a centre for the dissemination of information on techniques and technology, is enormous.

The location of all model units has been carefully selected so that they can have an immediate positive effect on other small industries in the area. The function of the production units is not to compete with existing business but to encourage them to improve their products. In this respect the units are having some tangible success.

Concern has been expressed in the past that the small industries in the informal sector will not be able to meet the increased demand for building materials with regard to quantity and quality. This may be true at present, especially as the activities in connection with the construction of low-cost housing are gaining momentum, but with an accelerated effort to disseminate improved techniques and technologies to the associated entrepreneurs, and an improved system to co-ordinate their efforts, they could play a major role in improving the material supply situation.

By order of the President of Indonesia, a model unit generating biomass energy is to be established in each province throughout the country. The Ministry of Forestry is co-ordinating these activities through project JTA-9A, assisted by the Dutch Government and based at the Institute Technology Bandung (ITB). Following negotiations with the UNIDO project DP/INS/81/006 and project JTA-9A, the office of the President decided in 1986 that one of the units should be located in Palembang and another in Samarinda, and that they would be linked to the UNIDO wood-production units established at Sungai Buaya, Palembang and Segihan, Samarinda.

The biomass gasification plants are designed to utilize the wooden waste from the production units and to provide sufficient electrical power to operate all the wood-working and treatment machines of the plant. In addition it is planned to distribute surplus power to surrounding village communities.

Buildings to accommodate these plants have been constructed with funds provided by the local government. The installation of the equipment has been completed and a training programme has been carried out. All costs were borne by the JTA-9A project. In addition, project JTA-9A provided an amount of Rp 1,100,000/month, for a period of three months to cover all running costs. The JTA-9A project will monitor the operation of the gasification unit for a period of one year, in co-operation with the Sriwijaya University in Palembang and the Mulawarman University in Samarinda.

The technical adviser to the JTA-9A project, Mr. Koopman from the Twente University, the Netherlands, is to provide the UNIDO project with additional information concerning the utilization of excess heat generated by the biomass plant for the purpose of operating a wood-drying kiln.

A ceremony to inaugurate the establishment of these units took place in Kupang, Timor on 29 October 1987. At the ceremony which was attended by the Minister of Forestry, also UNIDO representatives were present.

In the following sections, each of the six model production units will be evaluated, and problems in connection with their establishment and operation will be summarized.

Wood component and preservation unit, Sungai Buaya, Palembang (POST IA)

The production unit is operating well at almost full capacity. A full range of wood components for low-cost housing schemes is being produced. Market contracts have been well established and future prospects for a further development of the unit are good.

The prefeasibility study shows a reasonable market for the products, especially taking into account that the unit will produce standardized and preserved components, i.e. products which have not been available before.

The economic feasibility study forsees a reasonable net profit, a pay-back period for the total investment of four years, and a return on investment of 27 per cent.

Since there is no co-operative able to finance construction and rehabilitation of buildings or to provide adequate working capital, assistance was received from the local government.

The production machinery has been provided by UNDP/UNIDO as part of the technical assistance inputs. In the management of the unit this equipment has to be regarded as a loan with depreciation funds accumulated on a special

account for further development and expansion. A standard method for profit calculation was prepared, based on the assessment of own equity and the value of the inputs received from UNIDO and the local government. The purpose of this exercise is to demonstrate the feasibility of the unit even if bank loans had been the source of financing.

Together with the establishment of the unit, assistance has been given in establishing supply arrangements to construction projects. Positive responses have been obtained from government enterprises, but further efforts have to be made besides general marketing to the private sector.

The unit is presently managed by the local government, its integration into the KUD is being processed.

Clay-bricks and roofing-tiles unit, Talang Kelapa, Palembang (POST IB)

This production unit has been in operation for approximately two years and the following experiences have been gained.

The unit is within the existing co-operative KUD Karya Tani. It is operated by local craftsmen who were involved in the production of clay products before the establishment. One outstanding individual, Mr. Wahid, took the initiative to organize the physical establishment of the unit. Also, the unit is using his raw material resources, kilns and buildings for which he is getting a compensation before the profit is distributed to the co-operative members. The advantage of this arrangement has been a dynamic business-oriented operation of the unit. The market for roofing tiles is large, but the unit is also engaged in producing clay bricks for which there is great demand.

Technically the production is running smoothly. The production equipment was provided by UNDP/UNIDO as part of the technical assistance inputs and an agreement has been signed by the KUD for the use of equipment (annex VII). In the management of the unit this equipment has to be regarded as a loan with depreciation funds accumulated on a special account for further development and expansion.

Clay-bricks and roofing-tiles unit, Sempaja, Samarinda (POST IIA)

This unit started commercial brick production in August 1986 using an existing kiln, and tile production began in September 1986 after a new kiln had been constructed from bricks produced by the unit. However, the new kiln provided by BIPIK developed faults, causing a stoppage of the tile production for the time being. Another kiln financed by UNIDO is now under construction and will be completed in December 1987.

The unit was originally established in co-operation with a very active roofing-tile producer, H. A. Rauf, and comprised local craftsmen within a co-operative (Sumber Murni) established for that purpose. Land was provided by Mr. Rauf, the buildings by the local government, kilns were financed by the Ministry of Industry (BIPIK) and UNIDO, and machinery by UNDP/UNIDO.

Recently arrangements were made for the unit to be jointly managed by the KUD and a private company. Additional working capital, amounting to Rp 20,000,000 has been generated from this new arrangement. The unit is presently concentrating on the production of bricks to construct the new kiln.

The use of tiles as a roof covering has been very limited in the Samarinda region. In the past, tiles were shipped to that area from as far as Surabaya

in East Java, and they were very expensive. The production unit is able to produce a good-quality tile at a relatively low price, therefore the market potential is wide.

Technically the production is running smoothly. However, the problems the unit has experienced with the kiln has affected its output. The organization of the unit represents a good example of joint co-operation between a KUD and the private sector.

Wood-component and preservation unit, Segihan, Tenggarong (POST IIB)

This production unit has been functioning since September 1987 and is now producing wood components for local construction companies.

The prefeasibility study shows a reasonable market for the products, especially taking into account that the unit will produce standardized and preserved components, which are not available in the area. It is also foreseen that a major output will be full knock-down transmigration houses, the production of which may be feasible if special arrangements for the supply of low-cost timber to the unit can be made.

The economic feasibility study foresees a reasonable net profit, a pay-back period for the total investment of four years, and a return on investment of 27 per cent.

The unit is part of the existing KUD Cahaya Tani. As the co-operative was not able to finance buildings and working capital, a joint-venture arrangement has been established with a local government enterprise, P. D. Peryanida, which is involved in construction contracting, and is a forest concession holder. This arrangement, which was the main reason for a more than three months' delay in the establishment of the unit, has been formalized in a legal agreement (annex VIII). This agreement may be considered a major output of the project as it opens legal possibilities for joint-venture arrangements in the development of industrial co-operatives.

The production machinery was provided by UNDP/UNIDO under a separate agreement (annex VII). Land (along the Mahakam river in a transmigration area) has been provided by Pertamina. An agreement has been signed by Pertamina, witnessed by the Head (Bupati) of the Kutai district local government.

Clay-bricks and roofing-tiles unit, Pakis, Malang (POST IIIA1)

This production unit has been in operation for about two years and the following experiences have been gained.

The unit, which forms one integrated factory, is part of the existing KUD Pakis. The co-operative provided buildings, kiln and working capital, the regional co-operative agency provided funds for land and the local government the access road.

Machines were provided by UNDP/UNIDO and an agreement has been signed by the KUD for the use of the equipment (annex VII). The unit is technically as well as financially operating well and may be the best example of an ideal industrial co-operative production unit established by the project. Successful market linkages to PERUMNAS Malang were established and the co-operative is now selling products on the free market.

Clay-bricks and roofing-tiles unit, Turen, Malang (POST IIIA2)

This production unit has been in operation for more than two years and the following experiences have been gained.

The unit was established by gathering several individual craftsmen in a non-integrated production unit within the existing KUD Turen. The craftsmen rehabilitated the existing buildings and kilns with loans from the KUD. The production output of the groups is still low and efforts to obtain bank loans for improvements have not yet succeeded. A minor share in the supply of roofing tiles to PERUMAS Malang did little to improve that very weak co-operative.

Further assistance in technology, management and marketing is needed. The unit was established purposely in that weak region at the request of the local government, to give the local craftsmen an opportunity to improve their positions, but it has been the projects experience that continuous morale and technical support over several years is needed to change the lot of these craftsmen.

C. Preparation of policy proposals

A consultant was provided by UNIDO in December 1986 to formulate a policy for the upgrading of the small-scale building materials industry. The conclusions and recommendations of that mission are contained in a separate report.

As stated in the evaluation mission report of December 1985 "The development objective and project objectives represent a vague, confused set of statements". Following this detailed evaluation and decisions made at subsequent tripartite review meetings, the activities of the project were reduced and confined to the work plans outlined in revision documents "H" of November 1985 and "J" of May 1987. Obviously no policy proposals could be formulated for areas that were considered not appropriate to project objectives or which were deleted.

Some of the reports and documents produced by the project (listed in annex III) could be considered as useful reference material for future policy formulation. These are:

(a) Policy guidelines for the establishment and administration of a production unit;

(b) Building materials for low-cost housing in Indonesia;

(c) Data bank: construction activities;

(d) Data bank: transmigration projects;

(e) Data bank: building materials industry;

(f) Role of KUD in the development of the building materials industry for low-cost housing;

(g) Report by Brawijaya University (socio-economic and technological) to the small-scale bricks and roofing-tiles industry;

(h) Follow-up study of pilot project in Solo;

(i) Manual for the rational application of building materials;

(j) Project description (six documents covering the six production units).

The successfully completed elements of the project have centred mainly on the establishment of six production units, the description and present status of the units is already covered in this report. From an analysis of the progress of each of the units, and the problems which they experienced during their establishment, the following can be concluded:

(a) Where strong interest from the private sector existed, the unit developed well;

(b) Efforts to establish the units within a KUD system were not very successful.

Considering these two important factors, and keeping in mind the concept of establishing "model" units in selected regions with a view to improve the supply of materials for low-cost housing, the following recommendations may be useful for future policy formulation:

(a) The present concept of establishing model units in selected regions should be expanded and interlinked with the national construction programme for low-cost housing;

(b) The management of the units should be entrusted to carefully selected, experienced and dynamic entrepreneurs from the private sector;

(c) All model units should be established and operated as commercially viable enterprises, but arrangements should be made for the units to function also as a centre for the demonstration of appropriate equipment and the distribution of relevant information on techniques and technology to benefit the local producers in the informal sector;

(d) The identification of the needs of local producers in the informal sector and the establishment of links between them and the model units should be the responsibility of the officers providing the extension services in the Department of Small-Scale Industries in the Ministry of Industry, with support from related ministries and government agencies in matters concerning the establishment of a KUD when required, generating financial support and developing linkages with the construction industry (marketing).

The present policy of the Government to increase the supply of low-cost housing through the various programmes executed by PERUMNAS, Transmigration, BTN, Kampong Improvement Schemes etc. certainly benefits a large sector of the population. As many countries have a shortage of housing, especially of lost-cost housing, similar to Indonesia, various schemes have been developed to improve the situation.

One approach in the low-cost housing sector, which has been successful in many countries, is the introduction of site and service/self-help construction programmes. These projects involve the people in the construction of their own dwelling which can be really low cost. The benefits derived from such self-help programmes can include the development of traditional construction methods, the improved utilization of local materials and the strengthening of the social awareness of the people involved.

A close interlinkage between the building-materials industry and the construction industry will strengthen their respective capabilities, and will have a positive effect on the national construction programme. In structuring the interlinkage, serious consideration must be given to the classification of building materials, the formulation of building codes of practice and building material/product standardization, and most importantly, the application of the standards and codes by the manufacturers, producers, designers, architects, builders, building supervisors, control officers etc.

Full details of low-cost housing construction programmes, formulated by the Government, should be disseminated, well in advance, to all concerned to enable the building-materials industry to plan for the production and supply of standardized materials.

The system of operating through a CPOT, RPOT and POSTs to co-ordinate project activities proved to be successful for the establishment of model units and in developing a linkage with the low-cost housing construction programme and the building-materials industry. This system should be further developed to strengthen the national low-cost housing construction programme.

D. Analysis of model production units

For each of the six production units a project description has been prepared, summarizing the planning and execution of the unit. The project description includes a prefeasibility study for the unit concerned.

It is proposed to analyse the viability of the units after they have been in full operation for a period of time. Based on these documents, policy proposals for the development of the small-scale building materials industry can be prepared.

IV. UTILIZATION OF PROJECT RESULTS

The development objective of the project was "to assist in the realization of the (REPELITA IV) housing targets by establishing a system of co-ordination of the multi-sectoral/departmental activities for promoting the production of building materials and equipment, and the construction industry". In this chapter the project results are evaluated, especially with regard to their contribution towards the realization of the project's development objective.

A. Project organization

The project organization which extends from the national level (CPOT) through the regional level (RPOT) to the subregional (Kabupaten) level (POST) and comprises officials from all ministries and agencies responsible for the development of housing construction and building-materials production, is a direct translation of the development objective into a specific exercise whereby the involved government officials co-operated in the establishment of six building-materials production units and created linkages between these units and the construction industry.

Upon termination of the technical assistance, this organization may be formally continued, or, as has been indicated by the Government, may be regarded as a pilot exercise to be continued in substance but through existing government channels. In both cases, the experience gained with the operation of the present project will be most useful because, as explained in chapter III, it was proven that co-ordinated efforts of existing government institutions and agencies are needed if they are to be successful in improving the production of building materials in the small-scale industries sector.

B. Model production units

From the exercise of establishing six co-operative model production units extensive experiences have been gained by the involved government agencies. The magnitude and intricacy of the problems connected with financing, management and marketing had been underestimated. The established units constitute well-documented models for in-depth study, and policy guidelines for future activities may be readily extracted.

It should be stressed that an imporvement of the production of building materials and components in the small-scale sector is necessary from a technical point of view, as these products are mostly of non-standard sizes and varying quality, which makes them unsuitable for organized housing and building construction. Irrespective of how large and difficult the task is, it is nonetheless necessary to tackle these problems if the small-scale industry sector is to play a role in supporting the Government's targets for low-cost housing construction.

V. CONCLUSIONS

Despite the handicaps which are amply exposed in the report of the in-depth evaluation mission, the project succeeded in completing its main task, the establishment of six model production units producing standardized building materials and components. The major difficulty has been the creation of supply arrangements between the units and the organized housing and building construction projects, not for technical reasons but due to lack of sufficient manpower for this task.

It can now be clearly recognized that the assistance given so far through the UNDP/UNIDO project is only a first step towards helping to solve the many problems associated with the supply of building materials for low-cost housing. Further assistance is certainly needed if a nation-wide improvement in this area is to be achieved.

Annex I

LIST OF EXPERTS

Code	Title	Name of expert	Time schedule: 1983 JFMAMJJASOND	1984 JFMAMJJASOND	1985 JFMAMJJASOND	1986 JFMAMJJASOND	1987 JFMAMJJASOND
11-01	Chief techical adviser	T. Ringsholt					
11-02	Building materials planning	B. Soederberg					
11-03	Industrial extension services	J. Farrall					
11-04	Field expert, Palembang	R. Ernst					
11-05	Field expert, Samarinda	P. Oudot					
11-06	Field expert Surabaya	T. Bartha					
11-50	Consultant in data processing	Marc De Smet					
11-50	Consultant in policy	W. K. Rowland					
11-50	Adviser, building materials	S. J. Farrall					
17-01	National team leader	Idi Soebroto					
17-02	NE, Building materials planning	L. E. Leasa					
17-03	NE, Industrial extension services	J. M. Simpoha					
17-04	NE, Field expert, Palembang	Z. A. Abbas					
17-05	NE, Field expert, Samarinda	Junaidy A.					
AsExp	Housing construction technology	Marc De Smet					
AsExp	Industrial economics	Tyty Kyostila					
AsExp	Housing construction technology	Jan Molhoek					

Annex II

GOVERNMENT PROJECT PERSONNEL a/

National Steering Committee

1.	Chairman	:	Head of the Agency for Industrial Research and Development Ministry of Industry
2.	Secretary	:	Secretary of the Minister of Public Housing
3.	Member	:	Director General of Regional Development, Ministry of Home Affairs
4.	Member	:	Director General of Settlement Preparation, Ministry of Transmigration
5.	Member	:	Director General Cipta Karya, Ministry of Public Works
6.	Member	:	Director General of Cooperative Business Development
7.	Member	:	President Director of the National Housing Authority
8.	Member	:	President Director of the National Saving Bank

Technical Team of the National Steering Committee

1.	Chairman	:	Secretary of the National Steering Committee
2.	Secretary	:	Secretary of the Agency for Industrial Research and Development, Ministry of Industry
3.	Member	:	Representative of the Ministry of Industry
4.	Member	:	Rep. of the Ministry of Home Affairs
5.	Member	:	Rep. of the Ministry of Transmigration
6.	Member	:	Rep. of the Ministry of Public Works
7.	Member	:	Rep. of the Ministry of Cooperatives
8.	Member	:	Rep. of the National Housing Authority
9.	Member	:	Rep. of the National Saving Bank

a/ This annex has not been formally edited.

Annex II (continued)

Post No.	Post Title	Name and gender of incumbent	Full/ part time	Assumed duty (date) Scheduled	Actual (Est.)
	CPOT Jakarta				
1.	Nat.Project Director	Mr. Pratopo S	F	10/82	10/82
2.	Senior staff of AIRD	Mr. Sudarmadji	P	4/83	4/83
3.	Staff of AIRD	Mr. Maria S	P	4/86	4/86
4.	Staff of AIRD	Mr. Djahidi	P	10/83	10/83
5.	Staff of AIRD	Mr. Budi R	P	4/86	4/86
6.	Staff of AIRD	Mr. Tur Budi	P	4/84	4/84
7.	Staff of AIRD	Mr. Noviardi	P	4/86	4/86
8.	Staff of CPOT	Mrs.Astrid Ifi	F	10/83	10/83
9.	Staff of CPOT	Ms. Elizabeth	F	4/85	4/85
10.	Staff of CPOT	Mr. Pribadi K	F	10/83	10/83
11.	Staff of CPOT	Mr. Wasono	F	10/83	10/83
12.	Staff of AIRD	Mr. Sularso	P	4/86	4/86
13.	Staff of AIRD	Mr. Hari Jon	P	4/86	4/86
14.	Driver Project	Mr. Sukardi	F	10/83	10/83
	RPOT I South Sumatera				
1.	Head of RPOT I	Mr. Iskandar S	P	4/83	4/83
2.	Sec. of RPOT I	Mr. Burmawi	P	4/83	4/83
3.	Staff of IIRD	Mr. A.Rivai	P	4/86	4/86
4.	Staff of IIRD	Mr. Abdullah	P	4/86	4/86
5.	Staff of IIRD	Mr. Zulkifli S	P	4/86	4/86
6.	Staff of IIRD	Mr. Muhar Lakoni	P	4/86	4/86
	RSC I South Sumatera				
1.	Head of RSC I	Mr. Djulkip S	P	4/86	4/86
2.	Sec.of RSC I	Mr. Rahman Manap	P	4/86	4/86
3.	Staff of IIRD	Ms. Dewi Kusdianti	P	10/83	10/83
4.	Senior Staff of the Reg. Government	Mr. Umar Choiri	P	10/83	10/83
5.	Senior Staff of Coop.	Mr. Juwono	P	4/86	4/86
6	Staff of Cipta karya Public Work Office	Mr. Momon K	P	4/86	4/86
7.	Perumnas Reg. of South Sumatera	Mr. Ario Saputro	P	4/86	4/86

Annex II (continued)

Post No.	Post Title	Name and gender of incumbent	Full/ part time	Assumed duty (date) Scheduled	Actual (Est.)
	POST IA Palembang South Sumatera				
1.	Head of Palembang Local Industries Office as Head of POST IA	Mr. Nursidin NS	P	4/86	4/86
2.	Staff of IIRD	Mr. Patoni Gafar	P	4/86	4/66
3.	Staff of IIRD	Mr. Syamsul Bahri	P	4/86	4/66
4.	Staff of IIRD	Ms. Arini Rasma	P	4/86	4/86
5.	Staff of IIRD	Mr. Dewantara	P	4/86	4/86
6.	Staff of IIRD	Mr. Zulkifli S	P	4/86	4/66
7.	Staff of IIRD	Mr. Muhar Lakoni	P	4/86	4/86
	POST 1B Palembang South Sumatera				
1.	Staff of IIRD as Head of POST IB	Mr. Haryadi	P	4/86	4/86
2.	Staff of IIRD	Mr. Abul Ma'ali	P	4/86	4/86
3.	Staff of IIRD	Ms. Fahria Asyik	P	4/86	4/86
4.	Staff of IIRD	Mr. Soediyono	P	4/86	4/86
5.	Staff of IIRD	Mr. Genzah Tamsil	P	4/86	4/86
6.	Staff of UNSRI	Mr. Burhan	P	4/86	4/86
7.	Staff of IIRD	Ms. Harini S	P	4/86	4/86
	RPOT II East Kalimantan				
1.	Head of IIRD Project East Kalimantab as Head of RPOT II	Mr. Syahrudin	P	4/83	4/83
2.	Staff of Reg.Ind.Office	Ms. Sri Warasputy	P	4/86	4/86
3.	Staff of Reg.Ind.Office	Mr. Syamsudin	P	4/86	4/86
4.	Perumnas Reg.East Kalimantan	Mr. Mangunsong	P	4/86	4/86
	RSC II East Kalimantan				
1.	Senior Staff of Reg. Government as Head of RSC II	Mr. AB.Abdurrachim	P	4/66	4/86
2.	Sec. of RSC II	Mr. Moh.Herman P	P	4/86	4/86
3.	Staff of RSC II	Mr. Sunarko	P	4/86	4/86

Annex II (continued)

Post No.	Post Title	Name and gender of incumbent	Full/ part time	Assumed duty (date) Scheduled	Actual (Est.)
	RPOT III East Java				
1.	Head of IIRD as Head of RPOT III	Mr. Basuki	P	4/86	4/86
2.	Senior Staff Cipta Karya	Mr. Made Sutedja	P	4/86	4/86
3.	Head of Perumnas East Java	Mr. Moh.Besar	P	4/86	4/86
4.	Senior Staff Reg. Ind Office	Mr. Somidayat	P	4/86	4/86
	RSC III East Java				
1.	Senior Staff of Reg. Government as Head RSC III East Java	Mr. Suprapto	P	4/86	4/86
2.	Sec. of RSC III	Mr. Rahman K	P	4/86	4/86
3.	Head of Reg.Coop Office	Mr. Rosmawi	P	4/86	4/86
4.	Senior Staff of Cipta Karya	Mr. Sriyono	P	4/86	4/86
5.	Senior Staff of Reg.Gov	Mr. Mustakim H	P	4/86	4/86
6.	Senior Staff of Reg.Gov	Mr. Bambang H	P	4/86	4/86
	POST IIIA Malang East Java				
1.	Malang Reg.Gov. Sec. as Head of POST IIIA Malang	Mr. M.A.Samsuliadi	P	4/86	4/86
2.	Head of Malang Local Ind. Office	Mr. Ahmad Soebari	P	4/84	4/84
3.	Staff of Malang Local Coop.Office	Mr. Imam Hindi	P	4/86	4/86
4.	Staff of Malang Local Ind. Office	Mr. Edy Mulyono	P	4/83	4/83
5.	Staff of Malang Local Ind. Office	Mr. Samsul Arifin	P	4/86	4/86
6.	Staff of Malang Local Ind. Office	Mr. Supaidi	P	4/83	4/83
7.	Staff of Malang Local Ind. Office	Mr. Agus Eko B	P	4/86	4/86

Annex II (continued)

Post No.	Post Title	Name and gender of incumbent	Full/ part time	Assumed duty (date) Scheduled	Actual (Est.)
4.	Head of Reg.of Forestry Office	Mr. A.Malik	P	4/86	4/86
5.	Head of Reg.of Transmigration Office	Mr. Wargito R	P	4/86	4/86
6.	Head of Reg.of Cooperative Office	Mr. Bustam Ismail	P	4/86	4/86
7.	Head of Reg.of Public Work Office	Mr. Suntoro	P	4/86	4/86
	POST IIA East Kalimantan				
1.	Staff of Reg.Ind.Office as Head of POST IIA	Mr. Subagio			
2.	Staff of Samarinda Local Ind.Office	Mr. Saleh Efendi	P	4/86	4/86
3.	Head of Samarinda Local Coop.Office	Mr. Moh.Yamin	P	4/86	4/86
4.	Staff of Reg.Ind.Office	Mr. Molan	P	4/86	4/86
5.	Staff of Reg.Ind.Office	Mr. Arbainsyah	P	4/86	4/86
6.	Staff of Reg.Ind.Office	Mr. David ngo	P	4/86	4/86
7.	Staff POST IIA	Mr. Iskak	P	4/86	4/86
	POST IIB East Kalimantan				
1.	Head of Local East Kalimantan Ind.Kutai District	Mr. Aminudin	P	4/86	4/86
2.	Staff of Local Cooperative Kutai District	Mr. M.Sutarto	P	4/86	4/86
3.	Staff of IIRD	Ms. Fauziati	P	4/86	4/86
4.	Head of Local Mahakam Ulu East Kalimantan Forestry	Mr. Abdullah M	P	4/86	4/86
5.	Head of Kutai Local Public Work	Mr. Salman	P	4/86	4/86
6.	Typist	Mr. Suryanto	P	4/86	4/86

Annex III

LIST OF MAJOR DOCUMENTS

Title	Date	Remarks
A. General		
Plan of operation (E/I)	Nov. 1983	Presented to SC; several revisions prepared to comply with SC recommendations
Regular progress reports for Government every six months (I)		
Progress report 1-4 (E)	Dec. 1983 June 1984 Dec. 1984 June 1985	
Internal evaluation report (E)	15 May 1985	UNIDO monitoring
Schedule for execution of five regional projects (POST) (25 p., E/I)	Jan. 1984	The report is based on part of the plan of operation Agreed by SC 25 April 1984. Forms basis for establishment of five production units
Report of MPD and CTA visits to the three provinces (20 p., I)	Dec. 1983	Basis for elaborations of SC on 25 April 1984
Reports from investigation teams evaluation of five POST sites (12 + 14 + 15 p., I)	Dec. 1983	Basis for elaborations of SC on 25 April 1984 (one report for each region)
Information booklet 16 p., E/I)	March 1984	Distributed widely for information
Project scope (45 p., E/I) Project programme (26 p., E/I) Project activities (65 p., E/I)	Feb. 1985 July 1985 July 1985	SC requested to approve. Elaborated and agreed in 3TT meetings. SC not yet approved formally.
B. Industry		
Planning production units (PPU) (8 p., E/I)	April 1984	Distributed to regional offices for general use
Establishment of production units (EPU) (20 p., E/I)	April 1984	Distributed to regional offices for general use

continued

Annex III (continued)

Title	Date	Remarks
Organization of Indonesian Government: chart and translation sheets (3 p., E/I)	Feb. 1985	For general use
Policy guidelines for the establishment and administration of a production unit (5 p., E/I)	Feb. 1985	Distributed to regional offices for general use
General agreement on the use of equipment (4 p., E/I)	June 1985	Legal document
Economic evaluation for concrete block industry (13 p., E)	Aug. 1985	To be included in manual for establishment of a concrete block production unit
Building materials for low-cost housing in Indonesia (10 p., E/I)	Oct. 1984	Brochure for public use
Data bank: Construction activities (200 p., E)	Sept. 1984	For project use
Data bank: Transmigration projects (70 p., E)	Jan. 1985	For project use
Data bank: Building materials industry (60 p., E)	Jan. 1985	For project use
Small-scale bataco (cornblock) industry (5 p., I)	May 1984	For public use
Small-scale timber preservation unit for Indonesian less durable species (8 p., I)	Dec. 1984	For public use
Report on Solo INS/74/34 (20 p., I/E)	March 1984	For discussion with RPOT
Role of KUD in the development of building material industry for low-cost housing (46 p., I)	Feb. 1985	Paper for lecturing operator and supervisor for training for clay roofing tile production unit, Bandung
Revised proposal for wood component/timber treatment production unit (32 p., I)	June 1984	For National Project Director/Regional Steering Committee

continued

Annex III (continued)

Title	Date	Remarks
An approach to the utilization of logging waste and low-grade logs for low-cost housing (7 p., I)	Dec. 1984	For discussion with department of forestry
Cashflow management for small-scale industrial co-operative/ KUD (4 p., I)	Feb. 1985	For briefing KUD
Pricing policy for clay roofing tile (5 p., I)	March 1985	For discussion with RPOT/ POST
Lamtoro gung; fast growing species for building material industry for low-cost housing (13 p., I)	Sept. 1985	For public use
Report - Mission to Bandung Solo, Surabaya, Malang, Gresik, Tuban, Randublatung, Semarang (12 p., E)	Aug. 1985	Record of project activities
Equipment lists and layout for clay production units (4 p., E)	Feb. 1984	Used to establish 4 production units
Technology Bank: coding system section 3 - materials (10 p., E)	Aug. 1985	Project use to compile appropriate information
Equipment lists and workshop layout for wood component and timer treatment plant	Sept. 1985	For establishment units in Palembang and Samarinda
Equipment lists and layouts for material testing laboratories	Feb. 1985	For use by RPOT I, II, III
Terms of References for Socio-Economic and Technical Survey - Malang (52 p., E)	Dec. 1984	Survey completed by Brawijaya University
Management and operator training programme for small-scale brick and tile industry (12 p., E)	Nov. 1984	Training completed by CRDI, Bandung
Training programme for material testing laboratory technicians (4 p., E)	Nov. 1984	Training completed by CRDI, Bandung

continued

Annex III (continued)

Title	Date	Remarks
Procedure to establish and manage a village co-operative (chart)	March 1984	For project use
News clippings/low-cost housing in Indonesia (65 p., E/50 p., I)	1984-1985	For project use
Plan for follow-up pilot projects in Solo (2 p., E)	July 1985	For project evaluation
Production unit financial, investment and development plan (chart)	May 1984	For use by production units
Financial flow and profit distribution - KUD (chart)	May 1984	For use by production units
The use of plywood for constructing transmigration houses (3 p., I)	Jan. 1985	Proposal
Follow-up study of pilot project in Solo (185 p., E)	Dec. 1985	For project use
Low-cost housing		
- Requirements and capabilities	Aug. 1985	For project use
Basic manpower requirements		
- Wood components production and timber treatment plant	1985	For project use
Manual for rational application of building materials	1985	For project use
C. Planning and construction		
Building materials for low-cost housing. Presented at the seminar on Strengthening Housing Strategy for Low-Income Urban Groups, Jakarta 7-8 February 1985 (12 p., E)	Feb. 1985	Seminar attended by top government officials from Ministry of Works and Housing
Plywood house for transmigration. Including cost comparison with current standard design (7 [illegible]	Jan. 1985	Discussed with Transmigration and Ministry of Forestry

continued

Annex III (continued)

Title	Date	Remarks
The walk-up flat. A note for discussion (17 p., E)	June 1985	Presented to PERUMNAS
The PERUMNAS project in Solo. A follow-up survey. Justification and proposal for a questionnaire (7 p., E)	Feb. 1985	Discussed in detail with Institute for Human Settlements, Bandung
PERUMNAS house types. Proposal on modified design. Including cost comparative studies (7 p., E)	Sept. 1985	Presented and discussed with PERUMNAS
The SFB system. A brief summary. Presented at an East Asian Regional Seminar, Jakarta, 2-6 September 1985 (10 p., E)	Sept. 1985	With recommendation on a joint effort among the participating countries to use the system
Newsletter. Issue No. 1 (15 p., E/I)	April 1985	
Newsletter. Issue No. 2 (17 p., E/I)	July 1985	
Technology bank. System for organizing professional documents (5 p., E)	June 1985	For internal use mainly
Building for production unit. Drawings (5 p., E)	Sept. 1985	For direct use in Palembang
The concrete hollow block. A technical paper (20 p., E)	Aug. 1985	Presented at Seminar-Workshop in Kathmandu, 26 August-4 September 1985
Outline of a chapter for the Inter-Agency Committee for Transmigration. Including a matrix (4 p., E)	Aug. 1985	For UNDP
1. PERUMNAS construction programme (4 sheets)	Feb. until Dec. 1984	Collected from PERUMNAS head-office, Jakarta
2. Transmigration construction programmes (2 sheets)		Collected from Dept. of Transmigration, Jakarta

continued

Annex III (continued)

	Title	Date	Remarks
3.	Received DATAS from BTN branch East Java (3 booklets and 21 pages of construction projects by BTN developers 1983/84)	Feb. until Dec. 1984	BTN has no figures for future construction work, because it depends on the financial capability of respective developers
4.	Index calculations for materials use per 1, -M2 build area for computer input	Feb. until Dec. 1984	Index based on average figures from four different LCH types
5.	Visiting East Java to collect more detailed information from PERUMNAS and real estate BTN/ developers	Feb. until Dec. 1984	See attached report
6.	Calculating PERUMNAS and BTN house types	Feb. until Dec. 1984	For reaching figures of building materials index figures and construction-cost for material need calculations
7.	Cost comparison calculation PERUMNAS against Gangnail Rooftruss construction	Feb. until Dec. 1984	For making suggestions to decrease cost of LCH
1.	Calculations for project scope document, and three revisions (page - 8/A.1-5/ A.2-1/A.2-2/A.3-2/A.4-5/ A.4-6/A.4-7/A.4-8/A.4-9/ A.4-10/A.4-11/A.4-12/ A.4-13/A.5-2/A.5-3/A.6-3/ A.6-4)	Jan. until Sept. 1985	See related document
2.	Cost comparison calculation for conblocks and clay bricks		
3.	Attended Seminar on Fundamental Investigation for Housing Strategies for Urban Low Income		7-10 August 1985 in Jakarta. Suggestions were made for material distribution near LCH sites
4.	Making suggestions to PERUMNAS officials for more efficient construction methods and site management		At meetings in PERUMNAS head office Jakarta

continued

Annex III (continued)

Title	Date	Remarks
5. Articles in Newsletter No. 1 and 2		On construction aspects (a) General technology specifications (b) Improved interim payments
Project description:		
Industrial village co-operative producing standardized wood components in Palembang, South Sumatera (POST IA)	1986	General use
Project description:		
Industrial village co-operative producing standardized clay bricks and roofing tiles in Talang Kelapa, South Sumatera (POST IB)	1986	General use
Project description:		
Industrial village co-operative producing standardized wood components in Segihan, Tenggarong, East Kalimantan (POST IIB)	1986	General use
Project description:		
Industrial village co-operative producing standardized clay bricks and roofing tiles in Samarinda, East Kalimantan (POST IIA)	1986	General use
Project description:		
Industrial village co-operative producing standardized clay bricks and roofing tiles in Pakis, Malang, East Java (POST IIIA1)	1986	General use
Project description:		
Industrial village co-operative producing standardized clay bricks and roofing tiles in Turen, Malang, East Malang, Java (POST IIIA2)	1986	General use

Annex IV

LIST OF NON-EXPENDABLE EQUIPMENT a/

HQ Rec. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received Qty.	Received M.	Received Y	Condition	Qty. on hand	Remarks (Location)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
79/2		1	EA	VEHICLE: TOYOTA CORONA CHASSIS NO.: RT 132811756 ENGINE NO.: 18R 1862733 REG.NO.: B 217 AX	6.840.-	LP	1	1	80	Poor	1	RPOT-I
79/2		1	EA	AIRCONDITIONING FOR ABOVE (ATTACHED)	799.-	LP	1	1	80	Poor	1	- " -
83/1	10	1	EA	KETT DIGITAL WHITENESS METER FOR POWDER Model C-100	2,087.-	15-3-1404		3	84	Good	1	CRDI
83/1				LABORATORY EQUIPMENT:								
		1	EA	SAYBOLT VISCOMETER, DOUBLE UNIT 110V 60EZ 1FE HAZARDOUS - CONTAINS MERCURY	4,060.-	15-3-01392	1	3	84	Good	1	CRDI
		1	EA	STOPWATCH 0-30 SEC x 0.1 SEC SUBSIDIARY 0-15 MIN	52.-	- " -	1	3	84	Good	1	- " -
		1	EA	SCHMIDIT TEST HAMMER TYPE L	1,106.-	- " -	1	3	84	Good	1	- " -
83/1	17	1	EA	RAPID-HIGH TEMPERATURE FURNACE MODEL LHT 16/R	3,462.-	15-3-01402	1	5	84	Good	1	- " -
		1	EA	COMPLETE CONTROL SYSTEM	3,977.-	- " -	1	5	84	Good	1	- " -
83/1	11	1	EA	T-6420 TITRATER	742.-	15-3-01405	1			Good	1	- " -
83/1	27	1	EA	STRAIN GAUGE C426	520.-	15-3-01408	1	3	84	Good	1	- " -
	28	1	EA	WATER RETENTION APP.	374.-	- " -	1	3	84	Good	1	- " -
83/4	2	1	EA	REX ROTARY STENCIL DUPLICATOR RR790	802.-	15-3-1427	1			Good	1	CPOT
	3	1	EA	REX ROTARY STENCIL CUTTER RR2300	1,206.-	- " -	1			Good	1	CPOT
83/1	6	1	EA	LABORATORY-TYPE HIGH-PRESSURE AUTOCLAVE MODEL 6982	5,708.-	15-3-1403	1	5	84	Good	1	CRDI
	9	1	EA	ELECTRONIC PERMEABILITY TO AIR TESTER MODEL 7207 + CAPILLARY TUBES	4,212.-	- " -	1	5	84	Good	1	CRDI

a/ This annex has not been formally edited.

Annex IV (continued)

HQ Rec. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received			Condition	Qty. on hand	Remarks (Location)
							Qty.	M	Y			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
83/1	3	1	EA	DIGITAL CHEMCADET PH METER K-5984-00	293.-	15-3-1391	1	5	84	Good	1	CRDI
	4	1	EA	MAGNE-4 STIRRER WITH 4 HOT PLATES	440.-	- " -	1	"	"	Good	1	- " -
	25	1	EA	STANDARD HOOD NO. K-9010	2,396.-	- " -	1	"	"	Good	1	- " -
83/1	6	1	EA	MORTAR MIXER MODEL TC-527	1,378	15-3-1390	1	5	84	Good	1	- " -
	19	9	EA	3-GANG MORTAR MOLD MODEL C-84	2,360.-	- " -	9	"	"	Good	9	- " -
	20	1	EA	CALORIMETER MODEL TC-502	1,655.-	- " -	1	"	"	Good	1	- " -
	22	1	EA	LOS ANGELES TESTING MACHINE TC-520b	3,376.-	- " -	1	"	"	Good	1	- " -
	23	1	EA	RECTANGULAR SIEVE SHAKER MODEL TS-773	5,753.-	- " -	1	"	"	Good	1	- " -
	24	1	EA	VIBRATING TABLE MODEL TC-223	876.-	- " -	1	"	"	Good	1	- " -
	26	1	EA	EIRICH TYPE CONCRETE MIXER TC-536a	3,529.-	- " -	1	"	"	Good	1	- " -
83/3	1	2	EA	IBM SELECTRIC-3 TYPEWRITERS WITH 2 ORATORR TYPING BALLS	1,385.-	15-3-01416	2	6	84	Good	2	CPOT
83/1	21	1	EA	PLATINIUM CRUCIBLE, TALL FORM WITH LID 30 ML	1,688.-	15-3-1407	1	7	84	Good	1	CRDI
83/1	7	1	PCE	FLAME PHOTOMETER KK-217-332 COMPLETE	1,760.-	15-4-0289	1	8	84	Good	1	- " -
	15	1	EA	CRUCIBLE FURNACE KK266-492	3,512.-	- " -	1	"	"	Good	1	- " -
		1	EA	TEMP. MEASURING AND IND. OUTFIT KK 266-495	294.-	- " -	1	"	"	Good	1	- " -
83/1	1	1	EA	MODEL CT-306A-8 MASONRY SAW 220V50HZ	2,995.-	15-4-00472	1	8	84	Good	1	- " -
	2	1	EA	MODEL S-5 WATER STILL, 5GPH 110V60HZ	5,695.-	- " -	1	"	"	Good	1	- " -

Annex IV (continued)

HQ Rec. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received Qty.	Received M	Received Y	Condition	Qty. on hand	Remarks (Location)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
84/5				EQUIPMENT FOR PRODUCTION UNITS FOR ROOFING TILES FROM TARUNA AND MATAHARI:								
		2	sets	EXTRUDER - COMPLETE WITH HP DIESEL ENGINE	84,807.-	MOD.19-4-4602	2			Good	2	1-POSTIIIA1 1-POSTIIIA2
		10	"	SCREWPRESS	incl.	- " -	10			Good	10	5-POSTIIIA1 5-POSTIIIA2
		10	"	SCREWPRESS MOULDS FOR PALENTONG TILES	incl.	- " -	10			Good	10	
		2	"	SCREWPRESS MOULD FOR RIDGE TILES	incl.	- " -	2			Good	2	1-POSTIIIA1 1-POSTIIIA2
				(DELIVERED TO MALANG AUGUST 1984)								
		1	set	EXTRUDER - COMPLETE WITH HP DIESEL ENGINE	incl.	- " -	1			Good	1	POST IB
		5	"	SCREWPRESS	incl.	- " -	5			Good	5	- " -
		5	"	SCREWPRESS MOULDS FOR PALENTONG TILES	incl.	- " -	5			Good	5	- " -
		1	"	SCREWPRESS MOULDS FOR RIDGE TILES	incl.	- " -	1			Good	1	- " -
				(DELIVERED TO PALEMBANG OCTOBER 1984)								
		1	set	EXTRUDER - COMPLETE WITH HP DIESEL ENGINE	incl.	- " -	1			Good	1	POST IIA
		5	"	SCREWPRESS	incl.	- " -	5			Good	5	- " -
		5	"	SCREWPRESS MOULDS FOR PALENTONG TILES	incl.	- " -	5			Good	5	- " -
		1	"	SCREWPRESS MOULD FOR RIDGE TILES	incl.	- " -	1			Good	1	- " -
				(DELIVERED TO SAMARINDA NOVEMBER 1984)								
		1	EA	APPLE iie COMPUTER COMPLETE	4,805,-	MOD.19-4-4523	1	3	84	Good	1	CPOT
		1	EA	AMDEK 300 GREEN MONITOR	incl.	- " -	1			Good	1	- " -
		1	EA	EPSON AP-200 DUAL MINI DRIVE	incl.	- " -	1			Good	1	- " -
		1	EA	EPSON FX-100 PRINTER	incl.	- " -	1			Good	1	- " -

Annex IV (continued)

HQ Reg. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received Qty.	Received M	Received Y	Condition	Qty. on hand	Remark (Location)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
84/1		1	EA	VEHICLE: TOYOTA COROLLA 1300 SEDAN/AIRCOND. CHASSIS NO. : KE 70-9143540 ENGINE NO. : 4K - 6175912 REG. NO. : B 522 BX	5,833	MOD.19-4-4516	1	5	84	Good	1	CPOT
		2	EA	VEHICLE: VW COMBI/AIRCOND. CHASSIS NOS. : 9BW.ZZZ.23ZDP.32.025 and 9BW.ZZZ.23ZDP.32.267 ENGINE NOS : EZ.252.837 and EZ.252.851 REG. NO. : B 76175-58 and B 76178-58	17,314	- " -	2	4	84	Poor 2	B 76178 (CPOT)
84/4		1	EA	VEHICLE : TOYOTA LANDCRUISER, HARDTOP DIESEL ENGINE BJ 40 RV - KC CHASSIS NO. : BJ40 061148 ENGINE NO. : 0574409 REG. NO. : B 1368 BX	8,778	MOD.19-4-4595	1	1	85	Good Good	1	B 76175 (RPOT III) RPOT II
84/6		3	EA	SHARP PHOTOCOPIERS MODEL 760	4,590	MOD.19-4-4605	3			Good	3	RPOT-I/II/III(1-each)
84/3		3	EA	COMPACT 1500 MOTORISED COMPRESSION MACHINE	11,548	15-4-0850	3	12	84	Good	3	- " -
		3	EA	RECTANGULAR PLATENS COMPLETE	3,751	- " -	3	"	"	Good	3	- " -
		3	EA	200° C GENERAL PURPOSE OVEN	1,100	- " -	3	"	"	Good	3	- " -
		3	EA	BENCH MOUNTING SIEVE SHAKER EVSI	2,621	- " -	3	"	"	Good	3	- " -
		3	EA	CONCRETE TEST HAMMER	1,288	- " -	3	"	"	Good	3	- " -
		3	EA	TESTING ANVIL FOR EL35-147	1,641	- " -	3	"	"	Good	3	- " -
		3	EA	25 KG X 1 G FIELD AND LABORATORY SCALE	1,462	- " -	3	"	"	Good	3	- " -
		3	EA	5 KG X 1 G FIELD AND LABORATORY SCALE	1,085	- " -	3	"	"	Good	3	- " -
		3	EA	ELE PROSPECTING KIT	2,033	- " -	3	"	"	Good	3	- " -
83/9	1	1	EA	NATIONAL KEY TELEPHONE SYSTEM VB 351 FA	3,284	MOD.19-3-4616	1	2	84	Good	1	CPOT

Annex IV (continued)

HQ Req. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received Qty.	M	Y	Condition	Qty. on hand	Remarks (Location)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
85/1	1	1	PCE	ZORA BRICK MAKING MACHINE LJC/3 DIESEL POWER PACK	3,937.-	15-5-0772	1			Good	1	CRDI
	2	1	PCE	ZORA LJG/4 MANUAL POWER PACK	2,887.-	- " -	1			Good	1	-"-
84/7		3	EA	BENDING MACHINE	3,043.-	MOD 19-4-4637	3			Good	3	(1-each)
		3	EA	PLASTICITY TESTING EQUIPMENT	incl.	- " -	3			Good	3	RPOT I
		3	EA	PENETROMETER	incl.	- " -	3			Good	3	" II
		3	EA	SLUMP TEST EQUIPMENT	incl.	- " -	3			Good	3	" III
83/1	20	1	EA	CONCRETE TEST HAMMER TYPE N	240.-	15-3-01392	1	3	84	Good	1	CRDI
83/1	12	1	EA	FLASK WATER BATH 115V.1096.00.	265.-	15-3-1391	1	5	84	Good	1	-"-
83/1	13	1	EA	KITAGAWA GAS DETECTOR	364.-	15-3-C.1406	1			Good	1	-"-
83/1	18	1	EA	PS MORTAT AGATE/PESTEL	388.-	15-3-1407	1	7	84	Good	1	-"-
		1	EA	NATIONAL AIR CONDITIONER	366.-	MOD.13-4-32404	1	3	84	Good	1	CPOT
		1	EA	JVC CAMERA VIDEO GX-N70E	4,000.-	MOD 19-5-4614	1	8	85	Good	1	CPOT
		1	EA	JVC VIDEO PORTABLE HR-S10E	incl.	- " -	1			Good	1	-"-
		1	EA	VIDEO TRIPOD, DOLLY POD DP-2D AND VELBON PH 150	incl.	- " -						
		1	EA	VIDEO LIGHT,150 WATTS LAMP,BATTERY & CHARGER	incl.	- " -	1			Good	1	CPOT
		1	EA	PHOTO LIGHT,1000 WATTS, FLECTALUX GLS 1010			1			Good	1	-"-
		1	EA	SONY VIDEO RECORDER SL-F60	incl.	- " -	1			Good	1	-"-
		1	EA	JVC SPARE BATTERY	incl.	- " -	1			Good	1	-"-
		1	EA	SONY MICROPHONE ECM - Z 200	incl.	- " -	1			Good	1	-"-
		1	EA	JVC CARRYING CASE	incl.	- " -	1			Good	1	-"-
		1	EA	T.V. COLOUR 14 INCH KV-1430E	incl.	- " -	1			Good	1	-"-
		1	EA	XEROX 2970 PHOTOCOPY MACHINE	3,604.-	15-3-C1426	1	3	84	Good	1	-"-
		1	EA	SIERRA-JUKI ELECTRIC TYPEWRITER			1			Good	1	-"-

Annex IV (continued)

HQ Req. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received			Condition	Qty. on hand	Remarks (Location)
							Qty.	M	Y			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		2	EA	TABEL BAND RESAW SY-28A	12,043.-	MOD 19-6-5634	2	3	86	Good	2	1-POST IA 1-POSTIIB
				SAW DOCTORING WORKSHOP EQUIPMENTS:								
		2	EA	AUTO SHARPENER SY-700RB	22,302.-	MOD 19-6-5634	2	3	86	Good	2	1-POST IA 1-POSTIIB
		2	EA	STRETHER SY-8ST	incl.	- " -	2			Good	2	- " -
		2	EA	SETTING BLOCK SY-8SB	incl.	- " -	2			Good	2	- " -
		2	EA	WELDER CLAMP SY-80X	incl.	- " -	2			Good	2	- " -
		2	EA	SIDE GRINDER "DAIICHI KIKAI" DK-8	incl.	- " -	2			Good	2	- " -
		2	EA	"OMIX" SWAGE OB-1	incl.	- " -	2			Good	2	- " -
		2	EA	OXYGEN REGULATOR	incl.	- " -	2			Good	2	- " -
		2	EA	ACETYLENE REGULETOR	incl.	- " -	2			Good	2	- " -
		2	EA	WELDING TORCHER NO.0	incl.	- " -	2			Good	2	- " -
		2	EA	WELDING GOGGLE	incl.	- " -	2			Good	2	- " -
		2	EA	ELECTRIC GRINDER MACHINE 4"	incl.	- " -	2			Good	2	- " -
		2	SET	SCEW VICES 6"	incl.	- " -	2			Good	2	- " -
		2	SET	SHEARING CUTTER6"	incl.	- " -	2			Good	2	- " -
		2	SET	TOOL-KIT	incl.	- " -	2			Good	2	- " -
		2	EA	TENTION HUMMER	incl.	- " -	2			Good	2	- " -
		2	EA	TENTION GAUGE 5"	incl.	- " -	2			Good	2	- " -
		2	EA	TENTION BACK GAUGE 30"	incl.	- " -	2			Good	2	- " -
		2	UNIT	WOOD PRESERVATION PLANT	48,691	- " -	2	12	86	Good	2	- " -
				DIESEL GENERATOR SET:								
		2	EA	DIESEL ENGINE, FORD, TYPE 2726T, 11 KW	29,438	MOD 19-6-5629	2	5	86	Good	2	- " -
		2	EA	A.C. GENERATOR, STAMFORD, 3 PHASE, 75-80 KVA	incl.	- " -	2			Good	2	- " -
		2	SETS	HANDTOOLS	1,962	- " -	2	9	86	Good	2	- " -

Annex IV (continued)

HQ Rec. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received Qty.	Received M	Received Y	Condition	Qty. on hand	Remarks (Location)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
												1-POST IA
		2	EA	RADIAL ARM SAW	6,005.-	MOD 19-6-5629	2	3	86	Good	2	1-POSTIIB
		2	EA	SURFACE PLANER	8,692.-	- " -	2	3	86	Good	2	- " -
		2	EA	THICKNESS PLANER	10,341.-	- " -	2	6	86	Good	2	- " -
		2	EA	UNIVERSIAL WOOD MACHINE	10,391.-	- " -	2	6	86	Good	2	- " -
		2	EA	BAND SAW MACHINE	6,123.-	- " -	2	6	86	Good	2	- " -
		2	EA	MORTIZING MACHINE	5,807.-	- " -	2	6	86	Good	2	- " -
		2	EA	SOLID WOOD BORING MACHINE	8,221.-	- " -	2	6	86	Good	2	- " -
		2	EA	WOOD TURNING LATHE	2,021.-	- " -	2	6	86	Good	2	- " -
		2	EA	DOWEL MAKING MACHINE	2,712.-	- " -	2	7	86	Good	2	- " -
		2	EA	PORTABLE DUST COLLECTOR	1,665.-	- " -	2	3	86	Good	2	- " -
		2	EA	UNIVERSAL GRINDING MACHINE	10,107.-	- " -	2	6	86	Good	2	- " -
		2	EA	BAND SAW BLADE SHARPENING MACHINE	10,391.-	- " -	2	6	86	Good	2	- " -
		2	EA	BAND SAW BLADE CUTTER	331.-	- " -	2	6	86	Good	2	- " -
		2	EA	BAND SAW BLADE WELDING MACHINE	3,820.-	- " -	2	6	86	Good	2	- " -
		2	EA	BAND SAW BLADE JOINT GRINDER	1,819.-	- " -	2	6	86	Good	2	- " -
		2	EA	DRILL PRESS	2,248.-	- " -	2	3	86	Good	2	- " -
		2	EA	HAND DRILLING MACHINE	581.-	- " -	2	3	86	Good	2	- " -
		4	EA	ORBITAL SANDER	1,286.-	- " -	4	7	86	Good	4	2-POST IA 2-POSTIIB
		1	EA	BRICK AND TILE KILN	11,285	CONTRACT NO. 87/60/RK	1					POST IIA
		2	EA	DRILLS, BLADES AND CUTTERS	8,216,-	MOD. 19-6-8633	2	6	87	Good	2	POST IA & IIB
		1	EA	WATER SUPPLY SYSTEM POST IA (PAL)	1,715,-	" 19-6-5629	1	12	86	Good	1	POST IA
		1	EA	" " " POST IIB (SAM)	1,813,-	" 19-6-5629	1	12	86	Good	1	POST IIB
		1	EA	ELECTRICAL DISTRIBUTION SYSTEM POST IA	2,373,-	" 19-6-5629	1	12	86	Good	1	POST IA
		1	EA	- " - - " - - " - POST IIB	2,471,-	" 19-6-5629	1	12	86	Good	1	POST IIB

Annex V

TRAINING PROGRAMMES

Training course	Duration	Name and gender of participant	Started (date)		Completed (date)	
			Scheduled	Actual	Scheduled	Actual
A. MANAGEMENT TRAINING		BANDUNG				
(CRDI - BANDUNG)	20 Days	1. Drs.R.A.Roni Ali	03.11.	03.11.	24.11.	24.11.
		2. M.Nurhasan	1986	1986	1986	1986
		3. Rustam Efendi				
		4. Win Sumarni				
		5. Mulyani				
		6. Muhar Lakoni				
		7. Drs.Abubakar HA				
		8. Suparlan				
		9. Drs.Edward				
		10. Amiddin				
		11. Sardi				
		12. Aminuddin M				
B. MATERIAL TESTING TRAINING		SAMARINDA				
(CRDI - BANDUNG)	9 Days	1. Abdul Rivai	20.8.	20.8.	29.8	29.8
		2. Nurul Huda	1986	1986	1986	1986
		3. Zaenal Hanafiah				
		4. Fauziati				
		5. Mujiati				
		6. Prayitno				
		PALEMBANG				
	11 Days	1. Murdjono	02.9	02.9	15.9	15.9
		2. Suyatno	1986	1986	1986	1986
		3. Mansyur				
		4. A.Fadil				

Annex V (continued)

Training course	Duration	Name and gender of participant	Started (date)		Completed (date)	
			Scheduled	Actual	Scheduled	Actual
MATERIAL TESTING TRAINING (CRDI - BANDUNG)	10 Days	SURABAYA 1. Djumhanto 2. Subardono 3. Beni SK 4. Siswoyo Utomo 5. Nono Indiarto 6. Daryanto 7. Surap 8. Sudjarwo	10.9 1986	10.9 1986	20.9 1986	20.9 1986
C. SAW DOCTORING TRAINING (INHUTANI I - BEKASI)	30 Days	BEKASI - WEST JAVA 1. Muchsin Arfah 2. Kusno Sularso. 3. Andoko Risbiyanto 4. Syarifudin K	22.10 1986	22.10 1986	20.11 1986	20.11 1986
D. TIMBER TREATMENT PLAN OPERATOR TRAINING (INHUTANI I - SAMARINDA)	20 Days	SAMARINDA 1. Suparlan 2. Joko Prihatin 3. Edison Rasidi 4. Karto Suwiryo 5. Wancik HM 6. Ayinun Yahya	27.10 1986	27.10 1986	15.11 1986	15.11 1986
E. WOOD OPERATORS MACHINE (PT.INTERWOOD PG)	20 Days	PALEMBANG 1. Nagiri 2. Karnadi 3. Efendi 4. Bastari Zainal 5. Muhamad Indik 6. Sukamto	17.11 1986	17.11 1986	7.12 1986	7.12 1986

Annex V (continued)

Training course	Duration	Name and gender of participant	Started (date)		Completed (date)	
			Scheduled	Actual	Scheduled	Actual
F. WOOD MACHINE OPERATORS (PT. INTERWOOD PG)	20 Days	SAMARINDA 1. Sriyanto 2. Ayinun 3. Edison 4. Sunarto 5. Handoko 6. Talib	17.11.1986		7.12.1966	
G. ASSEMBLY WORKERS (NAT.EXPERT)	7 Days	PALEMBANG GROUP OF 6 WORKERS				
H. ASSEMBLY WORKERS (PT. INTERWOOD)	7 Days	SAMARINDA GROUP OF 6 WORKERS	1.9.1987		7.9.1987	
I. FOSTER BROTHER (CRDI-BANDUNG)		PAKIS 1. Mubinjayadi 2. Teddy Sumardjo 3. Bambang Supriadi 4. Agus Sulistioko				
J. EXCHANGE OF EXPERIENCES (CRDI-BANDUNG)		PAKIS 1. Mubinjayadi 2. Teddy Sumardjo 3. Bambang Supriadi 4. Agus Sulistioko 5. A.Wahid 6. M.Tourick 7. H.Abdurahim 8. Drs.Syaiful'a 9. Hadi Rahmanto 10. Wiyadi 11. Y.Suhartadi Bsc 12. Paidi 13. Syamsul Arifin 14. Suhitno 15. Yoyo Candra W 16. Al Khavidi 17. Tamaji	8,8,1987		7.9.1988	

Annex V (continued)

Training course	Duration	Name and gender of participant	Started (date)		Completed (date)	
			Scheduled	Actual	Scheduled	Actual
K. MANAGEMENT AND OPERATOR FOR SMALL SCALE TILES BRICK INDUSTRY (CRDI-BANDUNG)	60 Days	BANDUNG 1. Marzaini 2. Yoyok Candra W 3. Bambang Heriyanto 4. A.Wahid HD 5. Abu yazid W.H 6. Sodikin 7. H.Abdurahim 8. M.Taurick 9. Muhammad Syarwani 10. Nasur 11. Abu Yamin MZ 12. Sodikin 13. Mustopa 14. Tari 15. Mubin Jayadi 16. Al Khavidi 17. Surahman 18. Muchlis 19. Tamaji 20. Dja'far 21. Sujito Hendro 22. Raji 23. Munir 24. Wahyudi	10/1.85	11/3.85	10/1.85	11/3.85

Annex VI

POLICY GUIDELINES FOR THE ESTABLISHMENT AND ADMINISTRATION OF A PRODUCTION UNIT a/

1. ESTABLISHMENT OF PRODUCTION UNIT

1.1. GENERAL

1.1.1. The Production unit (P.U) will be established and work towards achieving the aims and objectives of the project as detailed in the project document of INS/81/006, and its amendments.

1.2. LOCATION

1.2.1. The location of the P.U will be within the district of and subdistrict of.....prior approval having first been obtained from the CPOT through the R.S.C.

1.2.2. The exact location will be as indicated on map annex..... address being as follows:.....
.....
.....
.....

1.3. RESPONSIBILITIES

1.3.1. The P.U personnel shall cooperate fully with the members of POST with respect to all activities of the P.U.

1.3.2. POST will be directly responsible to the RPOT for the implementation of the work programme.

1.4. P.U. PERSONNEL

1.4.1. Personnel will be engaged for the P.U according to the recommendations of the CPOT as being the minimum requirements to carry out efficiently the operations involved for the running of the P.U in a viable manner.

1.4.2. All recruitment of personnel shall be made with the prior approval of POST and RPOT. However, the P.U management is fully responsible for personnel matters relating to the recruitment.

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1.5. TRAINING

1.5.1. Personnel at management and supervisory level shall make themselves available for upgrading courses according to the training programme approved by the CPOT.

1.5.2. Skills upgrading programmes will be introduced for operators and others workers. This training will be executed with the guidance of the CRDI Bandung.

1.6. EQUIPMENT

1.6.1. All machines and equipment supplied by the project INS/81/006 for use in the P.U will be issued to the accountable officer of the Ministry of Industry represented in the RPOT.

1.6.2. The equipment will remain the property of INS/81/006 until such time it is officially handed over to the government of Indonesia upon the termination of the project period after which time it is understood that arrangements will be made by the government to transfer the ownership of the equipment to the KUD/Coop. at an appropriate time.

1.6.3. A complete inventory of all equipment issued to the P.U will be kept. Copies of the inventories shall be filed at POST, RPOT and CPOT.

1.6.4. All losses, or identified deficiencies, must be immediately reported. The CPOT will make the final decision in connection with the responsibility for replacement.

1.6.5. No relocation of the equipment shall be made without the written decision of the CPOT.

1.6.6. The CPOT have the right to authorise the withdrawal of any or all issued equipment if for any reason it is being used for purposes incompatible with the project objectives.

1.7. COOPERATIVE

1.7.1. All activities of the P.U must be incorporated in a co-operative system/KUD in accordance with government policy.

1.7.2. It will be ensured that the personnel of the P.U shall be encouraged to become a full member of the KUD concerned.

1.8. SITE STATUS

1.8.1. The status of property being utilized by the project for the purpose of siting a P.U, or part thereof shall be categorized as follows:

a) directly owned by the coop/KUD and covered by a legal document to this effect

b) privately owned and with an agreement for the use of the property by the P.U for a specified period of time

c) government property designated for the use of the P.U in accordance with project activities.

1.8.2. Any compensation, expenditure or payment made for the use of both private and government property will be accounted for, and form part of the production costs.

1.8.3. The status of all property as stipulated in the aforesaid subparagraphs 1.8.1. (a)-(c) shall be legally agreed upon by all parties concerned. All documentation will be recorded and maintained according to the prevailing rules and regulations.

1.8.4. Any arrangements concerning the status of property not covered by the preceding paragraphs and which are considered to be beneficial for the implementation of the P.U programme shall obtain the prior approval of the CPDT before being enacted.

2. PRODUCTION UNIT OPERATIONS

2.1. WORKING GROUPS

2.1.1. The formation of working groups shall be formed through a collective agreement system.
The groups can consist of family, non family or mixed members.

2.1.2. The P.U. will be divided into the following operational sections, one group being responsible for one operational section only:

Section	Activity
1. Extruder x 1	Stock Raw mat.Process mat.Distrib.slabs
2. Pressing x 5	Stock slabs.Press.Dry tiles
3. Kiln x ?	Receive air dried tiles.Fire
4. Sales x 1	Stock control. Deliveries. Marketing

2.2. ACCOUNTING

2.2.1. Recommended output levels will be set through consultations with PDST and RPDT and approved by the CPDT.

2.2.2. Payments for production work will be based on output by each individual group.

2.2.3. Payment levels for groups and individuals will be assessed by the standard evaluation procedure set by the CPDT.

2.2.4. All production and marketing costs will be assessed by the CPDT in direct consultation with the RPDT. No adjustments to the fixed costs will be made without prior approval from the CPDT.

2.2.5. Proper accounts will be made in respect of all aspects of production and sales.

2.3. CASHFLOW

2.3.1. The cashflow system for the operation of the P.U. will be based on an industrial cooperative system formulated by CPDT and in accordance with the aims and objectives of the national coop movement.

2.4. MARKETING

2.4.1. The policy of marketing will be directly linked with the government's strategy for supplies of building materials for LCH.

2.4.2. Initially production will be aimed at the captive market of government sponsored construction programmes. Plans will be initiated to develop the private sector market within the project period.

3. PRODUCTION UNIT MODIFICATIONS

3.1. ADJUSTMENTS

3.1.1. In the case where adjustment to the P.U. activities is found necessary to improve operations, the P.U.personnel will cooperate with the PCST and RPOT to carry out the required action.

3.2. REMEDIAL ACTION

3.2.1. If for reason(s) apparent the P.U. is not fulfilling its commitments as covered by this document, the RPOT will consult the CPOT to consider the necessary remedial action. P.U. personnel will abide by any decisions made in this respect.

3.3. DISCONTINUATION

3.3.1. Where a decision has been made by the CPOT that in the interest of the project and all concerned the activities of the P.U. will be discontinued prior to the official termination date of the INS/81/006 assistance, the RPOT and POST will ensure that all the assets appertaining to the project are safeguarded.

Annex VII

GENERAL AGREEMENT ON THE USE OF EQUIPMENT a/

Made this day of ..... Month.....Year 19..
Between the Project INS/81/006 - Development of Building Materials for Low Cost Housing, the registered address being .....
.....
and represented by ..... National Project Director (NPD), hereinafter referred to as the First Party

and

The representative of the KUD/Co-op .....
whose official designation is .....
for and on behalf of the KUD/Co-op .....
.....?.....
being the registered address of the Second Party.

Both parties agree to the following terms and conditions for the implementation of the assistance for the establishment of a 'model' production unit located at .....
.....

ARTICLE I

The first party authorises the second party, and the second party agrees, to make use of the supplied equipment for the purpose of producing standard quality clay products for supplying the low-cost housing sector, in accordance with the 'project' objectives. The said equipment is as listed Annex I

ARTICLE II

The second party agrees to maintain all the equipment in a safe working condition, and implement the maintenance schedules as provided by the project INS/81/006, also to implement effective

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a/ This annex has not been formally edited.

supervision thereof, with the objective of obtaining an efficient and economic production system.

ARTICLE III

The second party agrees to ensure that all rules, regulations and laws relating to environmental responsibilities are adhered to.

ARTICLE IV

The second party agrees that the equipment supplied by the first party to the KUD/Co-op will remain the property of the project INS/81/006 until such time it is officially handed over to the Department of Industry upon termination of the project INS/81/006, after which time it is mutually understood that arrangements will be made by the government to transfer the ownership of the listed equipment to the KUD/Co-operative at an appropriate time.

ARTICLE V.

The second party agrees to maintain a complete inventory of all equipment issued by the project INS/81/006. Copies of the inventory will be made available to the first party or designated officials.

ARTICLE VI.

The second party agrees to report any losses or deficiencies which may occur prior to official transfer of said equipment to the first party. The first party will make the final decision regarding the responsibility for replacement, the second party will abide by any such decisions made in this respect.

ARTICLE VII

The second party agrees to consult the first party in con - nection with the location/relocation of equipment, no relocation will take place without the written permission of the first party.

ARTICLE VIII

The second party agrees to implement a cash-flow system as provided by the project INS/81/006. The system will include a depreciation and development fund. The fund will be generated from the sales at a rate of Rp. ..... per .....Tiles/Bricks. All amounts derived from the fund will be recorded in accordance with a standard accounting system, and will be deposited in a bank account in the name of KUD/Co-operative .....
.....

ARTICLE IX

The Depreciation and Development fund will be used for development purposes only in relation to the upgrading and extension of the production unit. Decisions in this respect will only be made by the head of the provincial Co-operative office in consultation with the first party or designated officials.

ARTICLE X

The first party reserves the right to withdraw part or all of the equipment if it is considered that the production unit is utilizing it for purposes incompatable with the policy guidelines as outlined in the attached document (Annex II) which forms part of the agreement.

In witness thereof the parties hereonto affix their signatures on this agreement with sincere and full responsibility.

First Party	Second Party
Signature	Signature.....
Designation.....	Designation.....

WITNESSES

KANWIL Co-operative

1. Signature .....

   Designation .....

RPOT

2. Signature .....

   Designation .....

POST

3. Signature .....

   Designation.....

Annex VIII

AGREEMENT FOR CO-OPERATION BETWEEN A CO-OPERATIVE AND A GOVERNMENT ENTERPRISE a/

Made this day, Saturday, the eighteenth day of October, Year 1986, between

I. Name : CAHAYA TANI KUD.

Address : The Village of Segihan, Sebulu sub-distrct, Kutai District.

Hereinafter called the First Party.

II. Name : Kutai Peryanida, PD.

Address : Tenggarong, Kutai District.

Hereinafter called the Second Party.

Whereas, both parties have agreed to cooperate in the establishment and operation of a Wood Component Production and Timber Preservation Unit of CAHAYA TANI KUD, to be implemented through the UNIDO Project INS/81/006 in Co-operation with the Ministry of Industry, and located in the village of Segihan, Sebulu sub-district, Kutai District, East Kalimantan Province, under the following terms :

Paragraph 1

(1). The Production Unit named CAHAYA TANI KUD Wood Component Production and Timber Preservation Unit will be managed and operated according to the policy guidelines in the document 'Policy Guidelines for the Establishment and Administration of Wood Component Production and Timber Preservation Unit (Annex 1), and the utilization of equipment provided by the Project INS/81/006 will be in accordance with the document -'General Agreement on the use of Euqipment' (Annex 2).

(2). The Head Office of the Production Unit mentioned in the paragraph (1) will be located in Tenggarong and the factory located at the village of Segihan, Sebulu sub-district, Kutai District.

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a/ This annex has not been formally edited.

Paragraph 2

The cooperation between the First Party and the Second Party will last for a period of 10 (ten) years and will be reconsidered for renewal of the agreement when the period has expired.

Paragraph 3

In the implementation of the cooperation both parties agrees to follow the general terms for the Production Unit as established by the Project INS/81/006 and to be controlled by a Board of Control, as follows :

1. Representative of Local Government of Kutai District. - Chairman + Member
2. Representative of Board of Control of Kutai Peryanida, PD. - Member
3. Representative of Auditing Board of CAHAYA TANI KUD. - Member
4. Representative of Provincial Office of Min. of Industry, Kutai District. - Member
5. Representative of Provincial Office of Min. of Cooperative, Kutai District. - Member

Paragraph 4

The Borad of Control as detailed in paragraph 3 has the duty to control the management od the Production Unit and perform a annual evaluation, and is responsible to the Government represented by the Head of East Kalimantan Provincial Office of Min. of Industry. The details of the duties will be arranged by the Government which hereinafter, in this agreement, means the Head of East Kalimantan Provincial Office of Min. of Industry.

Paragraph 5

(1). Both parties agree to provide the amount of capital inputs as follows :

1. CAHAYA TANI KUD - CAPITAL INPUT is considered to be Rp. 137,000,000,- (One hundred and thirty seven million five hundred thousand rupiah) - (67%) in the form of machines and equipment provided by UNIDO INS/81/006.

2. KUTAI PERYANIDA, PD. - CAPITAL INPUT will be Rp. 67,000,000,- (Sixty seven million rupiah) - (33%) in the form of P.U. buildings and warehouses of max. Rp. 45,000,000,- (Forty five million rupiah) and working capital of min. Rp. 22,000,000,- (Twenty two million rupiah).

2. It is agreed that the distribution of the obtained profit/loss will be calculated based on the capital inputs of both parties.

Paragraph 6

The distribution of capital inputs and profit/loss mentioned in paragraph 5 will be reconsidered when the ten (10) years period has expired considering that CAHAYA TANI KUD intends to reimburse the financial input from KUTAI PERYANIDA, PD. and be in full control of the production unit's capital.

Paragraph 7

Manpower requirements necessary for managing and operating production unit will be appointed as follows :

(1). The General Manager will be proposed by KUTAI PERYANIDA,PD. and the Production Manager proposed by the CAHAYA TANI KUD.

(2). These two positions mentioned above and all additional appointments has to be approved by both parties and must conform with the document 'Basic Manpower Requirements' - Wood Component Production and Timber Preservation Plant' prepared by the UNIDO Project INS/81/006.

Paragraph 8

The General Manager is responsible to the Board of Director of CAHAYA TANI KUD.

Paragraph 9

(1). Any disputes of the interpretation of content implementation of this agreement will be amicably negotiated (first stage) by both parties.

(2). If the first negotiation fails to reach the required settlements, both parties agree that the settlement will be negotiated in the second stage by both parties together with the Board of Control.

(3). If the second negotiation fails to reach the required settlements, both parties agree that the settlements will be negotiated in the third stage by both parties together with the Government.

(4). All non negotiable disputes arising from this agreement will be settled through a legal procedure of the District Court in Tenggarong.

Paragraph 10

Both parties agree that the domicile of the parties for all lawful acts in the implementation of this agreement will be this office of the District Court in Tenggarong.

Paragraph 11

All other matters not covered by this agreement will be negotiated amicably by both parties and the Government.

Paragraph 12.

This agreement is effective as from the date of signing by both parties, and made in two copies on stamped forms, each of the copies has equal lawful value.

Prepared in Tenggarong on:
Date :

SECOND PARTY	FIRST PARTY
(_____)	(_____)
Director KUTAI PERYANIDA, PD.	Chairman, CAHAYA TANI KUD.

WITNESSES

1. Drs.Syachruddin :
   Chairman, RPOT

2. M.Tobing :
   Head, Office of Min.
   of Co-op., KUTAI

3. Aminuddin :
   Head, Office of Min.
   of Industry,TENGGARONG

APPROVED BY

1. BUPATI, Head of Kutai District.

(_____)

2. KAKANWIL, Head of Provincial Office of Min. of Industry, SAMARINDA.

(_____)

3. KAKANWIL, Head of Provincial Office of Min. of Co-op., SAMARINDA.

(_____)

Annex IX

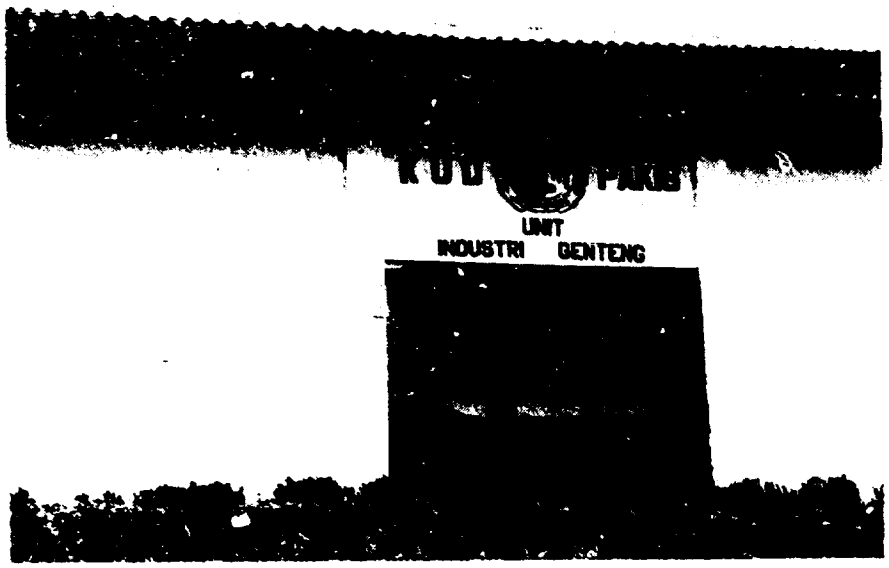
VIEWS OF ACTIVITIES IN THE SIX MODEL PRODUCTION UNITS

A. Clay production unit, Turen Malang, East Java (POST I1A2)

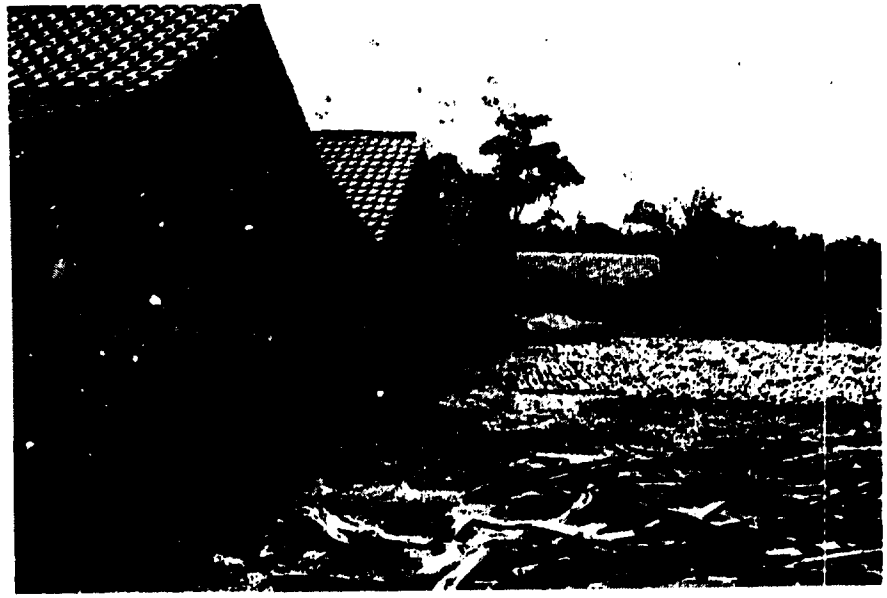
General view of the unit

Taking delivery of tiles

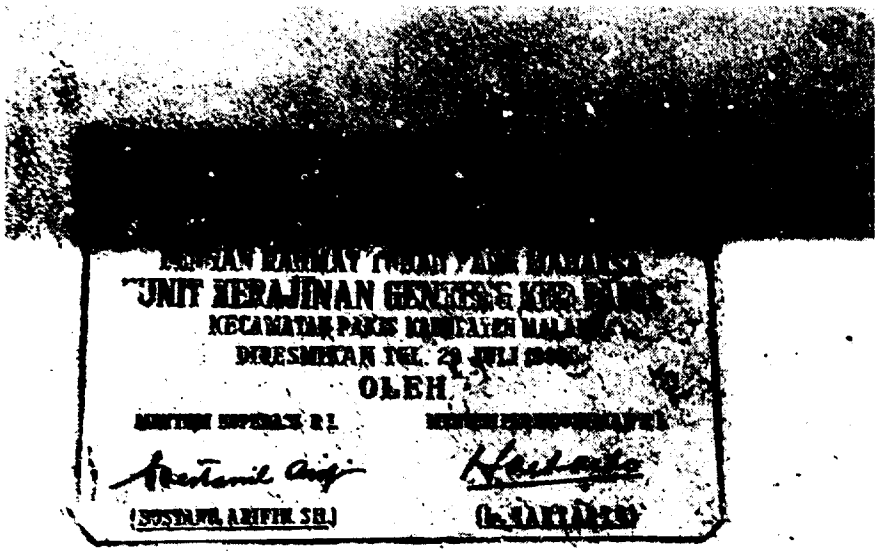
B. Clay production unit, Pakis, Malang, East Java (POST IIIA1)



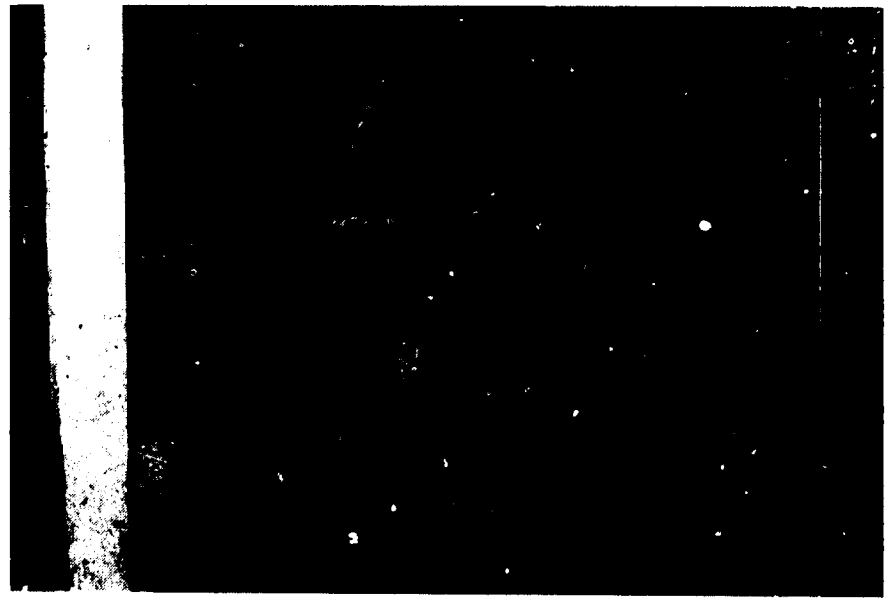
Entrance to office and extruder building



General view of the site



Wall plaque with signatures of the minister of co-operatives and the minister of industry



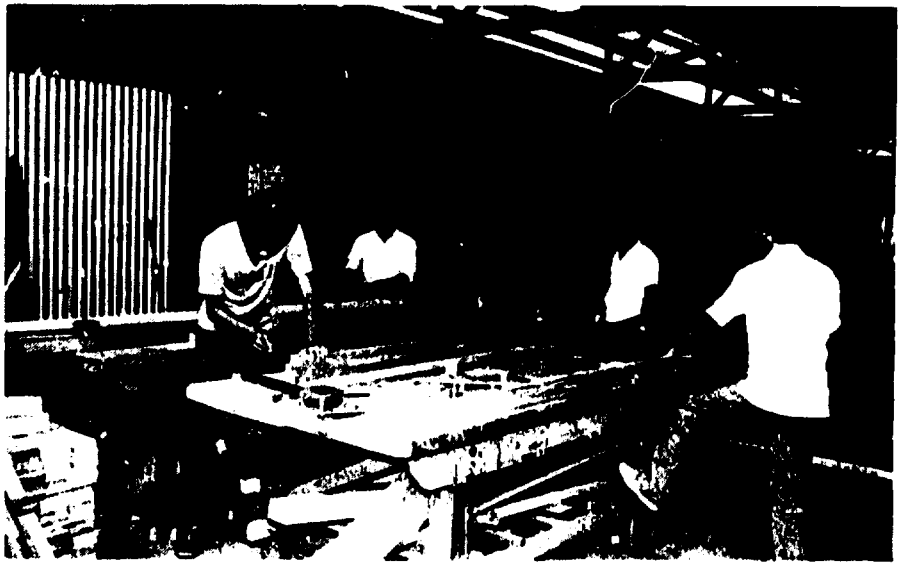
Tile press in action

C. Wood production unit, Sungai Buaya, Palembang, South Sumatra (POST IA)

General view of workshop and preservation unit

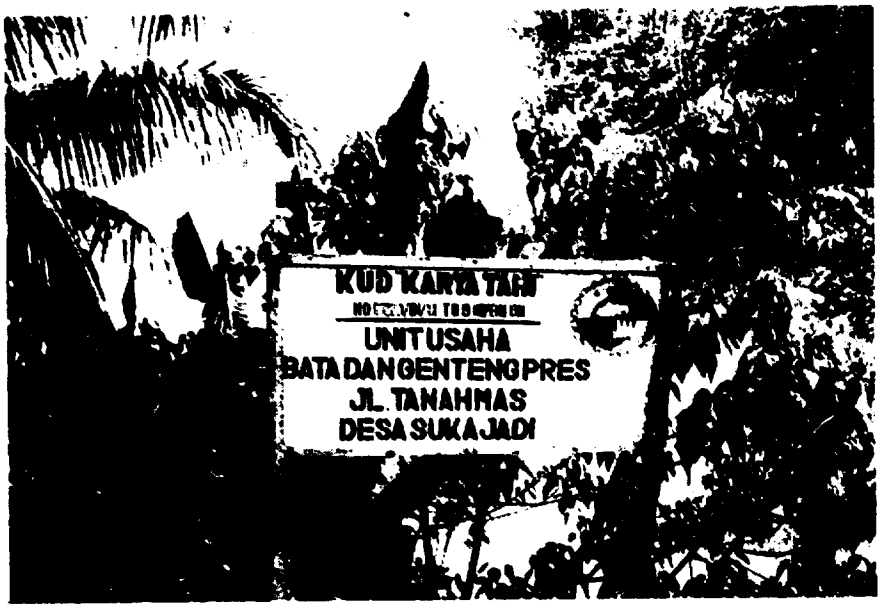
Machine shop in full production

Wood-preservation plant

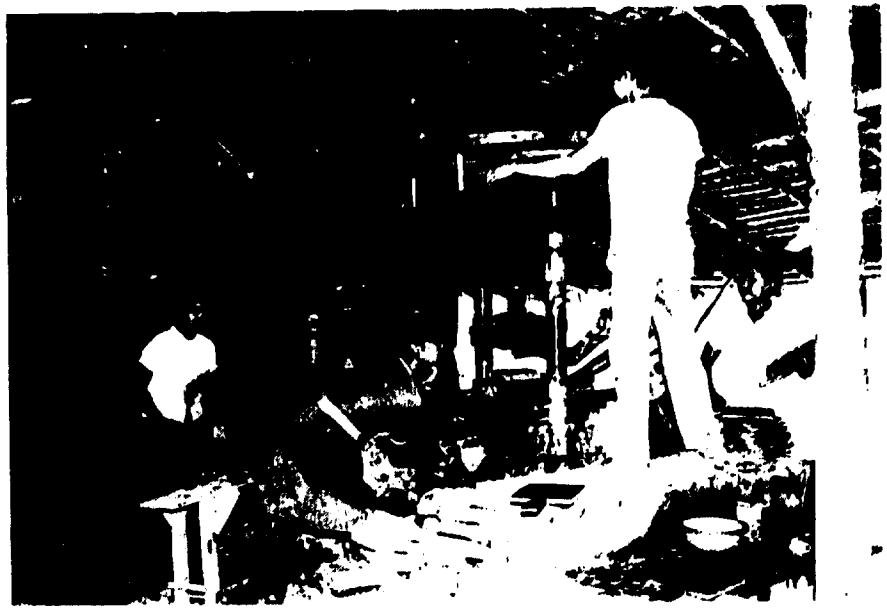


Component assembly section

D. Clay production unit, Talang Kelapa, Palembang, South Sumatra (PUST IB)

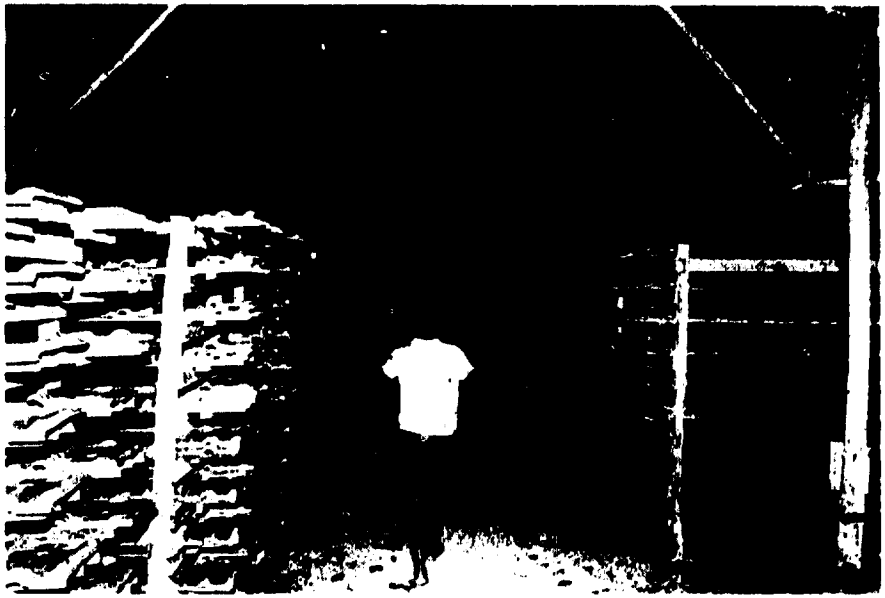


The KUD sign board at the entrance to the unit



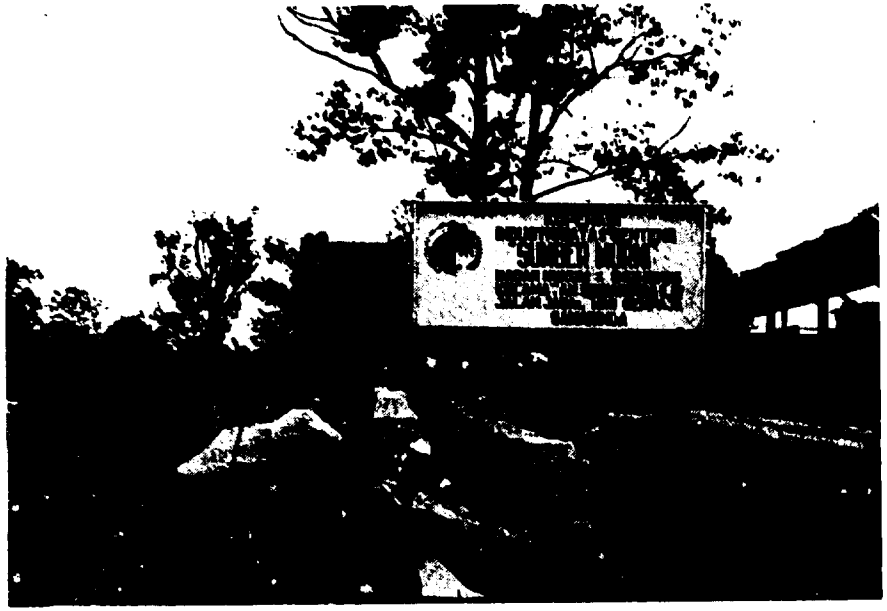
Operating the tile press

Operating the extruder - family involvement



Placing green tiles in the racks

E. Clay production unit, Sempaja, Samarinda, East Kalimantan (POST IIA)



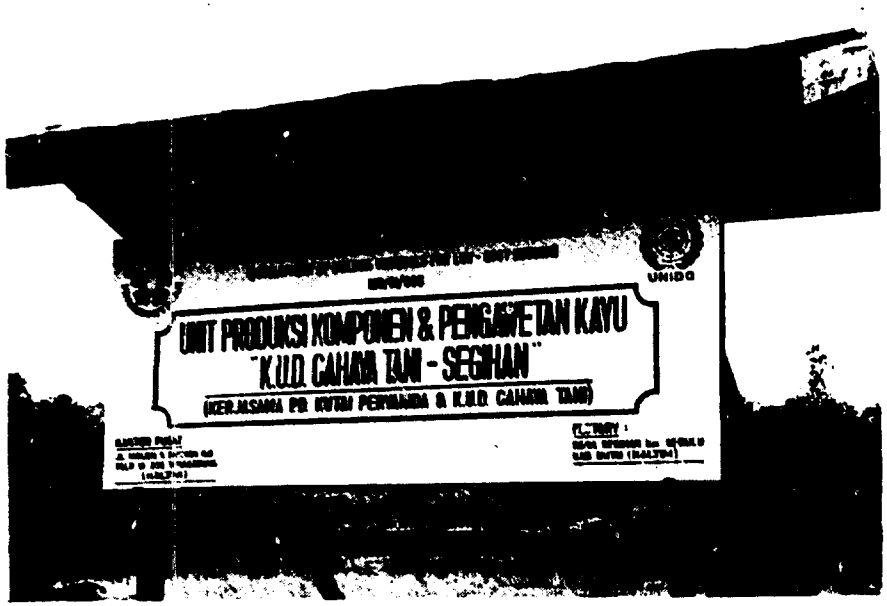
General view of the unit

Operating the extruder

Curing green products

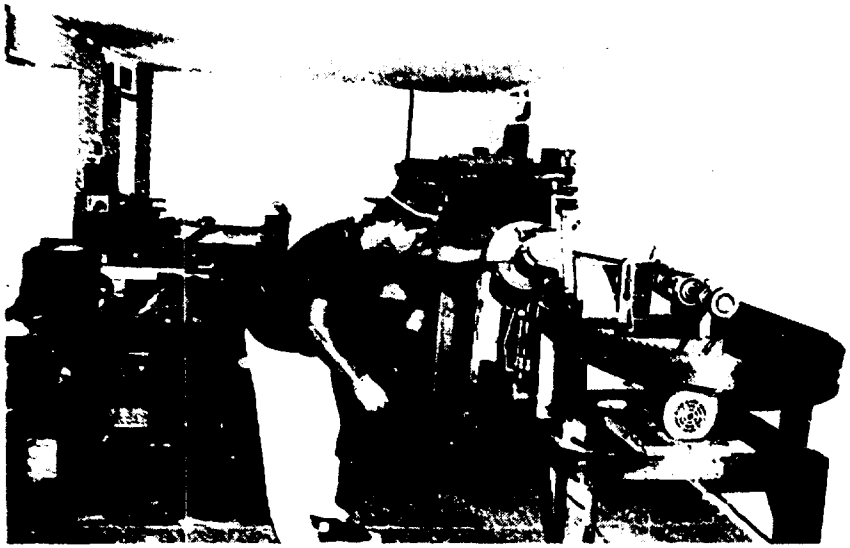
Ceremony - completion of foundations for new kiln

F. Wood production unit, Segihan, Samarinda, East Kalimantan (POST IIB)



The KUD sign board

General view of the site



Saw-doctoring unit

Converting large-section timber